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PREVIOUS CAT QUESTION PAPER

CAT 2000

Before the Test:

1. DO NOT REMOVE THE SEAL OF THIS BOOKLET UNTIL THE SIGNAL TO START IS GIVEN.
2. Keep only a pencil, eraser and sharpener with you. DO NOT KEEP with you books, rulers, slide rules, drawing instruments, calculators (including watch calculators), pagers, cellular phones, stop watches or any other device or loose paper. These should be left at a place indicated by the invigilator.
3. Use only HB pencil to fill in the Answer Sheet.
4. Enter in your Answer Sheet: (a) in Box 3, the Test Form Number that appears at the bottom of this page, (b) in Box 4, the Test Booklet Serial Number that appears at the top of this page.
5. Ensure that your personal data have been entered correctly on Side - II of the Answer Sheet.
6. Ensure that you have entered your 8-digit Test Registration Number in Box 2 of the Answer Sheet correctly. Start entering the number from the leftmost cell, leaving the last three cells blank.

At the start of the Test:

1. As soon as the signal to start is given, open the Test Booklet.
2. This Test Booklet contains 40 pages, including the blank ones. Immediately after opening the Test Booklet, verify that all the pages are printed properly and are in order. If there is a problem with your Test Booklet, immediately inform the invigilator. You will be provided with a replacement.

How to answer:

1. This test contains 165 questions in three sections. **There are 55 questions in Section I, 55 questions in Section II and 55 questions in Section III**. You have two and half hours to complete the test. In distributing the time over the three sections, please bear in mind that you need to demonstrate your competence in all three sections.
2. Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles on the Answer Sheet. Each question has only one correct answer.
3. **All Questions carry one mark each. For a wrong answer you will lose one-third of the marks allotted to the question.**
4. Do your rough work only on the Test Booklet and NOT on the Answer Sheet.
5. Follow the instructions of the invigilator. Students found violating the instructions will be disqualified.

After the Test:

1. At the end of the test, remain seated. The invigilator will collect the Answer Sheet from your seat. Do not leave the hall until the invigilator announces "You may leave now". The invigilator will make this announcement only after collecting the Answer Sheets from all the students in the room.
2. You may retain this Test Booklet with you.

Test Form Number: 111

Section I

Instructions for questions 1 - 8:
The passage given below is followed by questions. Choose the best answer for each question.

The current debate on intellectual property rights (IPRs) raises a number of important issues concerning the strategy and policies for building a more dynamic national agricultural research system, the relative roles of public and private sectors, and the role of agribusiness multinational corporations (MNCs). This debate has been stimulated by the international agreement on Trade Related Intellectual Property Rights (TRIPs), negotiated as part of the Uruguay Round. TRIPs, for the first time, seeks to bring innovations in agricultural technology under a new worldwide IPR regime. The agribusiness MNCs (along with pharmaceutical companies) played a leading part in lobbying for such a regime during the Uruguay Round negotiations. The argument was that incentives are necessary to stimulate innovations, and that this calls for a system of patents which gives innovators the sole right to use (or sell/lease the right to use) their innovations for a specified period and protects them against unauthorised copying or use. With strong support of their national governments, they were influential in shaping the agreement on TRIPs, which eventually emerged from the Uruguay Round.

The current debate on TRIPs in India- as indeed elsewhere- echoes wider concerns about 'privatisation' of research and allowing a free field for MNCs in the sphere of biotechnology and agriculture. The agribusiness corporations, and those with unbounded faith in the power of science to overcome all likely problems, point to the vast potential that new technology holds for solving the problems of hunger, malnutrition and poverty in the world. The exploitation of this potential should be encouraged and this is best done by the private sector for which patents are essential. Some, who do not necessarily accept this optimism, argue that fears of MNC domination are exaggerated and that farmers will accept their products only if they decisively outperform the available alternatives. Those who argue against agreeing to introduce an IPR regime in agriculture and encouraging private sector research are apprehensive that this will work to the disadvantage of farmers by making them more and more dependent on monopolistic MNCs. A different, though related apprehension is that extensive use of hybrids and genetically engineered new varieties might increase the vulnerability of agriculture to outbreaks of pests and diseases. The larger, longer-term consequences of reduced biodiversity that may follow from the use of specially bred varieties are also another cause for concern. Moreover, corporations, driven by the profit motive, will necessarily tend to underplay, if not ignore, potential adverse consequences, especially those which are unknown and which may manifest themselves only over a relatively long period. On the other hand, high-pressure advertising and aggressive sales campaigns by private companies can seduce farmers into accepting varieties without being aware of potential adverse effects and the possibility of disastrous consequences for their livelihood if these varieties happen to fail. There is no provision under the laws, as they now exist, for compensating users against such eventualities.

Excessive preoccupation with seeds and seed material has obscured other important issues involved in reviewing the research policy. We need to remind ourselves that improved varieties by themselves are not sufficient for sustained growth of yields. In our own experience, some of the early high yielding varieties (HYVs) of rice and wheat were found susceptible to widespread pest attacks; and some had problems of grain quality. Further research was necessary to solve these problems. This largely successful research was almost entirely done in public research institutions. Of course, it could in principle have been done by private companies, but whether they choose to do so depends crucially on the extent of the loss in market for their original introductions on account of the above factors and whether the companies are financially strong enough to absorb the 'losses', invest in research to correct the

deficiencies and recover the lost market. Public research, which is not driven by profit, is better placed to take corrective action. Research for improving common pool resource management, maintaining ecological health and ensuring sustainability is both critical and also demanding in terms of technological challenge and resource requirements. As such research is crucial to the impact of new varieties, chemicals and equipment in the farmer's field, private companies should be interested in such research. But their primary interest is in the sale of seed material, chemicals, equipment and other inputs produced by them. Knowledge and techniques for resource management are not 'marketable' in the same way as those inputs. Their application to land, water and forests has a long gestation and their efficacy depends on resolving difficult problems such as designing institutions for proper and equitable management of common pool resources. Public or quasi-public research institutions informed by broader, long-term concerns can only do such work.

The public sector must therefore continue to play a major role in the national research system. It is both wrong and misleading to pose the problem in terms of public sector versus private sector or of privatisation of research. We need to address problems likely to arise on account of the public-private sector complementarily, and ensure that the public research system performs efficiently. Complementarily between various elements of research raises several issues in implementing an IPR regime. Private companies do not produce new varieties and inputs entirely as a result of their own research. Almost all technological improvement is based on knowledge and experience accumulated from the past, and the results of basic and applied research in public and quasi-public institutions (universities, research organisations). Moreover, as is increasingly recognised, accumulated stock of knowledge does not reside only in the scientific community and its academic publications, but is also widely diffused in traditions and folk knowledge of local communities all over.

The deciphering of the structure and functioning of DNA forms the basis of much of modern biotechnology. But this fundamental breakthrough is a 'public good' freely accessible in the public domain and usable free of any charge. Varieties/techniques developed using that knowledge can however be, and are, patented for private profit. Similarly, private corporations draw extensively, and without any charge, on germ plasm available in varieties of plants species (neem and turmeric are by now famous examples). Publicly funded gene banks as well as new varieties bred by public sector research stations can also be used freely by private enterprises for developing their own varieties and seek patent protection for them. Should private breeders be allowed free use of basic scientific discoveries? Should the repositories of traditional knowledge and germ plasm be collected which are maintained and improved by publicly funded institutions? Or should users be made to pay for such use? If they are to pay, what should be the basis of compensation? Should the compensation be for individuals or for communities/institutions to which they belong? Should individuals/ institutions be given the right of patenting their innovations? These are some of the important issues that deserve more attention than they now get and need serious detailed study to evolve reasonably satisfactory, fair and workable solutions. Finally, the tendency to equate the public sector with the government is wrong. The public space is much wider than government departments and includes co-operatives, universities, public trust and a variety of non-governmental organizations (NGOs). Giving greater autonomy to research organizations from government control and giving non-government public institutions the space and resources to play a larger, more effective role in research, is therefore an issue of direct relevance in restructuring the public research system.

1. Which one of the following statements describes an important issue, or important issues, not being raised in the context of the current debate on IPRs?

(1) The role of MNCs in the sphere of biotechnology and agriculture.
(2) The strategy and policies for establishing an IPR regime for Indian agriculture.
(3) The relative roles of public and private sectors.
(4) Wider concerns about 'privatisation' of research.

2. The fundamental breakthrough in deciphering the structure and functioning of DNA has become a public good. This means that

(1) breakthroughs in fundamental research on DNA are accessible by all without any monetary considerations.
(2) the fundamental research on DNA has the characteristic of having beneficial effects for the public at large.
(3) due to the large scale of fundamental research on DNA, it falls in the domain of public sector research institutions.
(4) the public and other companies must have free access to such fundamental breakthroughs in research.

3. In debating the respective roles of the public and private sectors in the national research system, it is important to recognise

(1) that private companies do not produce new varieties and inputs entirely on their own research.
(2) that almost all technological improvements are based on knowledge and experience accumulated from the past.
(3) the complementary role of public-and private-sector research.
(4) that knowledge repositories are primarily the scientific community and its academic publications.

4. Which one of the following may provide incentives to address the problem of potential adverse consequences of biotechnology?

(1) Include IPR issues in the TRIPs agreement.
(2) Nationalise MNCs engaged in private research in biotechnology.
(3) Encourage domestic firms to patent their innovations.
(4) Make provisions in the law for user compensation against failure of newly developed varieties.

5. Which of the following statements is not a likely consequence of emerging technologies in agriculture?

(1) Development of newer and newer varieties will lead to increase in biodiversity.
(2) MNCs may underplay the negative consequences of the newer technology on environment.
(3) Newer varieties of seeds may increase vulnerability of crops to pests and diseases.
(4) Reforms in patent laws and user compensation against crop failures would be needed to address new technology problems.

6. The TRIPs agreement emerged from the Uruguay Round to

(1) address the problem of adverse consequences of genetically engineered new varieties of grain.
(2) fulfil the WTO requirement to have an agreement on trade related property rights.
(3) provide incentives to innovators by way of protecting their intellectual property.
(4) give credibility to the innovations made by MNCs in the field of pharmaceuticals and agriculture.

7. Public or quasi-public research institutions are more likely than private companies to address the negative consequences of new technologies, because of which of the following reasons?

(1) Public research is not driven by profit motive.
(2) Private companies may not be able to absorb losses arising out of the negative effects of the new technologies.
(3) Unlike new technology products, knowledge and techniques for resource management are not amenable to simple market transactions.
(4) All of the above.

8. While developing a strategy and policies for building a more dynamic national agricultural research system, which one of the following statements needs to be considered?

(1) Public and quasi-public institutions are not interested in making profits.
(2) Public and quasi-public institutions have a broader and long-term outlook than private companies.
(3) Private companies are incapable of building products based on traditional and folk knowledge.
(4) Traditional and folk knowledge cannot be protected by patents.

Instructions for questions 9 - 16:
The passage given below is followed by questions. Choose the best answer for each question.

One of the criteria by which we judge the vitality of a style of painting is its ability to renew itself- its responsiveness to the changing nature and quality of experience, the degree of conceptual and formal innovation that it exhibits. By this criterion, it would appear that the practice of abstractionism has failed to engage creatively with the radical change in human experience in recent decades. It has, seemingly, been unwilling to re-invent itself in relation to the systems of artistic expression and viewers' expectations that have developed under the impact of the mass media.
The judgment that abstractionism has slipped into 'inertia gear' is gaining endorsement, not only among discerning viewers and practitioners of other art forms, but also among abstract painters themselves. Like their companions elsewhere in the world, abstractionists in India are asking themselves an overwhelming question today: Does abstractionism have a future? The major crisis that abstractionists face is that of revitalising their picture surface; few have improvised any solutions beyond the ones that were exhausted by the 1970s. Like all revolutions, whether in politics or in art, abstractionism must now confront its moment of truth: having begun life as a new and radical pictorial approach to experience, it has become an entrenched orthodoxy itself. Indeed, when viewed against a historical situation in which a variety of subversive, interactive and richly hybrid forms are available to the art practitioner, abstractionism assumes the remote and defiant air of an aristocracy that has outlived its age: trammelled by formulaic conventions yet buttressed by a rhetoric of sacred mystery, it seems condemned to being the last citadel of the self-regarding 'fine art' tradition, the last hurrah of painting for painting's sake.

The situation is further complicated in India by the circumstances in which an indigenous abstractionism came into prominence here during the 1960s. From the beginning it was propelled by the dialectic between two motives, one revolutionary and the other conservative-it was inaugurated as an act of emancipation from the dogmas of the nascent Indian nation state, when art was officially viewed as an indulgence at worst, and at best, as an instrument for the celebration of the republic's hopes and aspirations. Having rejected these dogmas, the pioneering abstractionists also went on to reject the various figurative styles associated with the Shantiniketan circle and others. In such a situation, abstractionism was a revolutionary move. It led art towards the exploration of the subconscious mind, the spiritual quest and the possible expansion of consciousness. Indian painting entered into a phase of self-inquiry, a meditative inner space where cosmic symbols and non-representational images ruled. Often, the transition from figurative idioms to abstractionist ones took place within the same artist.

At the same time, Indian abstractionists have rarely committed themselves wholeheartedly to a non-representational idiom. They have been preoccupied with the fundamentally metaphysical project of aspiring to the mystical-holy without altogether

renouncing the symbolic. This has been sustained by a hereditary reluctance to give up the murti, the inviolable iconic form, which explains why abstractionism is marked by the conservative tendency to operate with images from the sacred repertoire of the past. Abstractionism thus entered India as a double-edged device in a complex cultural transaction. Ideologically, it served as an internationalist legitimisation of the emerging revolutionary local trends. However, on entry, it was conscripted to serve local artistic preoccupations– a survey of indigenous abstractionism will show that its most obvious points of affinity with European and American abstract art were with the more mystically oriented of the major sources of abstractionist philosophy and practice, for instance the Kandinsky-Klee school. There have been no takers for Malevich's Suprematism, which militantly rejected both the artistic forms of the past and the world of appearances, privileging the new-minted geometric symbol as an autonomous sign of the desire for infinity.

Against this backdrop, we can identify three major abstractionist idioms in Indian art. The first develops from a love of the earth, and assumes the form of a celebration of the self's dissolution in the cosmic panorama; the landscape is no longer a realistic transcription of the scene, but is transformed into a visionary occasion for contemplating the cycles of decay and regeneration. The second idiom phrases its departures from symbolic and archetypal devices as invitations to heightened planes of awareness. Abstractionism begins with the establishment or dissolution of the motif, which can be drawn from diverse sources, including the hieroglyphic tablet, the Sufi meditation dance or the Tantric diagram. The third idiom is based on the lyric play of forms guided by gesture or allied with formal improvisations like the assemblage. Here, sometimes, the line dividing abstract image from patterned design or quasi-random expressive marking may blur. The flux of forms can also be regimented through the poetics of pure colour arrangements, vector-diagrammatic spaces and gestural design.

In this genealogy, some pure lines of descent follow their logic to the inevitable point of extinction, others engage in cross-fertilization, and yet others undergo mutation to maintain their energy. However, this genealogical survey demonstrates the wave at its crests, those points where the metaphysical and the painterly have been fused in images of abiding potency, ideas sensuously ordained rather than fabricated programmatically to a concept. It is equally possible to enumerate the thoughts where the two principles do not come together, thus arriving at a very different account. Uncharitable as it may sound, the history of Indian abstractionism records a series of attempts to avoid the risks of abstraction by resorting to an overt and near-generic symbolism, which many Indian abstractionists embrace when they find themselves bereft of the imaginative energy to negotiate the union of metaphysics and painterliness.

Such symbolism falls into a dual trap: it succumbs to the pompous vacuity of pure metaphysics when the burden of intention is passed off as justification; or then it is desiccated by the arid formalism of pure painterliness, with delight in the measure of chance or pattern guiding the execution of a painting. The ensuing conflict of purpose stalls the progress of abstractionism in an impasse. The remarkable Indian abstractionists are precisely those who have overcome this and addressed themselves to the basic elements of their art with a decisive sense of independence from prior models. In their recent work, we see the logic of Indian abstractionism pushed almost to the furthest it can be taken. Beyond such artists stands a lost generation of abstractionists whose work invokes a wistful, delicate beauty but stops there.

Abstractionism is not a universal language; it is an art that points up the loss of a shared language of signs in society. And yet, it affirms the possibility of its recovery through the effort of awareness. While its rhetoric has always emphasised a call for new forms of attention, abstractionist practice has tended to fall into a complacent pride in its own incomprehensibility; a complacency fatal in an ethos where vibrant new idioms compete for the viewers'

attention. Indian abstractionists ought to really return to basics, to reformulate and replenish their understanding of the nature of the relationship between the painted image and the world around it. But will they abandon their favourite conceptual habits and formal conventions, if this becomes necessary?

9. Which one of the following is not stated by the author as a reason for abstractionism losing its vitality?

(1) Abstractionism has failed to reorient itself in the context of changing human experience.
(2) Abstractionism has not considered the developments in artistic expression that have taken place in recent times.
(3) Abstractionism has not followed the path taken by all revolutions, whether in politics or art.
(4) The impact of mass media on viewers' expectations has not been assessed, and responded to, by abstractionism.

10. Which one of the following, according to the author, is the role that abstractionism plays in a society?

(1) It provides an idiom that can be understood by most members in a society.
(2) It highlights the absence of a shared language of meaningful symbols which can be recreated through greater awareness.
(3) It highlights the contradictory artistic trends of revolution and conservatism that any society needs to move forward.
(4) It helps abstractionists invoke the wistful, delicate beauty that may exist in society.

11. According to the author, which one of the following characterises the crisis faced by abstractionism?

(1) Abstractionists appear to be unable to transcend the solutions tried out earlier.
(2) Abstractionism has allowed itself to be confined by set forms and practices.
(3) Abstractionists have been unable to use the multiplicity of forms now becoming available to an artist.
(4) All of the above.

12. According to the author, the introduction of abstractionism was revolutionary because it

(1) celebrated the hopes and aspirations of a newly independent nation.
(2) provided a new direction to Indian art, towards self-inquiry and non-representational images.
(3) managed to obtain internationalist support for the abstractionist agenda.
(4) was emancipation from the dogmas of the nascent nation state.

13. Which one of the following is not part of the author's characterisation of the conservative trend in Indian abstractionism?

(1) An exploration of the subconscious mind.
(2) A lack of full commitment to non-representational symbols.
(3) An adherence to the symbolic while aspiring to the mystical.
(4) Usage of the images of gods or similar symbols.

14. Given the author's delineation to the three abstractionist idioms in Indian art, the third idiom can be best distinguished from the other two idioms through its

(1) depiction of nature's cyclical renewal.
(2) use of non-representational images.
(3) emphasis on arrangement of forms.
(4) limited reliance on original models.

15. According to the author, the attraction of the Kandinsky-Klee school for Indian abstractionist can be explained by which one of the following?

(1) The conservative tendency to aspire to the mystical without a complete renunciation of the symbolic.

(2) The discomfort of Indian abstractionists with Malevich's Suprematism.
(3) The easy identification of obvious points of affinity with European and American abstract art, of which the Kandinsky-Klee school is an example.
(4) The double-edged nature of abstractionism which enabled identification with mystically-oriented schools.

16. Which one of the following, according to the author, is the most important reason for the stalling of abstractionism's progress in an impasse?

(1) Some artists have followed their abstractionist logic to the point of extinction.
(2) Some artists have allowed chance or pattern to dominate the execution of their paintings.
(3) Many artists have avoided the trap of a near-generic and an open symbolism.
(4) Many artists have found it difficult to fuse the twin principles of the metaphysical and the painterly.

Instructions for questions 17 - 24:
The passage given below is followed by questions. Choose the best answer for each question.

In a modern computer, electronic and magnetic storage technologies play complementary roles. Electronic memory chips are fast but volatile (their contents are lost when the computer is unplugged). Magnetic tapes and hard disks are slower, but have the advantage that they are non-volatile, so that they can be used to store software and documents even when the power is off.

In laboratories around the world, however, researchers are hoping to achieve the best of both worlds. They are trying to build magnetic memory chips that could be used in place of today's electronic ones. These magnetic memories would be non-volatile; but they would also be faster, would consume less power, and would be able to stand up to hazardous environments more easily. Such chips would have obvious applications in storage cards for digital cameras and music-players; they would enable hand-held and laptop computers to boot up more quickly and to operate for longer; they would allow desktop computers to run faster; they would doubtless have military and space-faring advantages too. But although the theory behind them looks solid, there are tricky practical problems that need to be overcome.

Two different approaches, based on different magnetic phenomena, are being pursued. The first, being investigated by Gary Prinz and his colleagues at the Naval Research Laboratory (NRL) in Washington, D.C., exploits the fact that the electrical resistance of some materials changes in the presence of a magnetic field- a phenomenon known as magneto-resistance. For some multi-layered materials this effect is particularly powerful and is, accordingly, called "giant" magneto-resistance (GMR). Since 1997, the exploitation of GMR has made cheap multi-gigabyte hard disks commonplace. The magnetic orientations of the magnetised spots on the surface of a spinning disk are detected by measuring the changes they induce in the resistance of a tiny sensor. This technique is so sensitive that it means the spots can be made smaller and packed closer together than was previously possible, thus increasing the capacity and reducing the size and cost of a disk drive.

Dr. Prinz and his colleagues are now exploiting the same phenomenon on the surface of memory chips, rather than spinning disks. In a conventional memory chip, each binary digit (bit) of data is represented using a capacitor-reservoir of electrical charge that is either empty or full-to represent a zero or a one. In the NRL's magnetic design, by contrast, each bit is stored in a magnetic element in the form of a vertical pillar of magnetisable material. A matrix of wires passing above and below the elements allows each to be magnetised, either clockwise or anti-clockwise, to represent zero or one. Another set of wires allows current to pass through any particular element. By measuring an element's resistance you can determine its magnetic orientation, and hence whether it is storing a zero or a one. Since the elements retain their magnetic orientation even when the power is off, the result is non-volatile memory. Unlike the elements of an electronic memory, a magnetic memory's elements

are not easily disrupted by radiation. And compared with electronic memories, whose capacitors need constant topping up, magnetic memories are simpler and consume less power. The NRL researchers plan to commercialise their device through a company called Non-Volatile Electronics, which recently began work on the necessary processing and fabrication techniques. But it will be some years before the first chips roll off the production line.

Most attention in the field is focused on an alternative approach based on magnetic tunnel-junctions (MTJs), which are being investigated by researchers at chip makers such as IBM, Motorola, Siemens and Hewlett-Packard. IBM's research team, led by Stuart Parkin, has already created a 500-element working prototype that operates at 20 times the speed of conventional memory chips and consumes 1 % of the power. Each element consists of a sandwich of two layers of magnetisable material separated by a barrier of aluminium oxide just four or five atoms thick. The polarisation of lower magnetisable layer is fixed in one direction, but that of the upper layer can be set (again, by passing a current through a matrix of control wires) either to the left or to the right, to store a zero or a one. The polarisations of the two layers are then in either the same or opposite directions.

Although the aluminium-oxide barrier is an electrical insulator, it is so thin that electrons are able to jump across it via a quantum-mechanical effect called tunnelling. It turns out that such tunnelling is easier when the two magnetic layers are polarised in the same direction than when they are polarised in opposite directions. So, by measuring the current that flows through the sandwich, it is possible to determine the alignment of the topmost layer, and hence whether it is storing a zero or a one.

To build a full-scale memory chip based on MTJs is, however, no easy matter. According to Paulo Freitas, an expert on chip manufacturing at the Technical University of Lisbon, magnetic memory elements will have to become far smaller and more reliable than current prototypes if they are to compete with electronic memory. At the same time, they will have to be sensitive enough to respond when the appropriate wires in the control matrix are switched on, but not so sensitive that they respond when a neighbouring element is changed. Despite these difficulties, the general consensus is that MTJs are the more promising ideas. Dr. Parkin says his group evaluated the GMR approach and decided not to pursue it, despite the fact that IBM pioneered GMR in hard disks. Dr. Prinz, however, contends that his plan will eventually offer higher storage densities and lower production costs.

Not content with shaking up the multi-billion-dollar market for computer memory, some researchers have even more ambitious plans for magnetic computing. In a paper published last month in Science, Russell Cowburn and Mark Welland at Cambridge University outlined research that could form the basis of a magnetic microprocessor- a chip capable of manipulating (rather than merely storing) information magnetically. In place of conducting wires, a magnetic processor would have rows of magnetic dots, each of which could be polarised in one of two directions. Individual bits of information would travel down the rows as magnetic pulses, changing the orientation of the dots as they went. Dr. Cowburn and Dr. Welland have demonstrated how a logic gate (the basic element of a microprocessor) could work in such a scheme. In their experiment, they fed a signal in at one end of the chain of dots and used a second signal to control whether it propagated along the chain.

It is, admittedly, a long way from a single logic gate to a full microprocessor, but this was true also when the transistor was first invented. Dr. Cowburn, who is now searching for backers to help commercialise the technology, says he believes it will be at least ten years before the first magnetic microprocessor is constructed. But other researchers in the field agree that such a chip is the next logical step. Dr. Prinz says that once magnetic memory is sorted out "the target is to go after the logic circuits." Whether all-magnetic computers will ever be able to compete with other contenders that are jostling to knock electronics off its perch-such as optical, biological and quantum computing-remains to be seen. Dr. Cowburn suggests that the future lies with hybrid machines that use different technologies. But computing with magnetism evidently has an attraction all its own.

17. In developing magnetic memory chips to replace the electronic ones, two alternative research paths are being pursued. These are approaches based on

(1) volatile and non-volatile memories.
(2) magneto-resistance and magnetic tunnel-junctions.
(3) radiation-disruption and radiation-neutral effects.
(4) orientation of magnetised spots on the surface of a spinning disk and alignment of magnetic dots on the surface of a conventional memory chip.

18. A binary digit or bit is represented in the magneto-resistance based magnetic chip using

(1) a layer of aluminium oxide.
(2) a capacitor.
(3) a vertical pillar of magnetised material.
(4) a matrix of wires.

19. In the magnetic tunnel-junctions (MTJs) tunnelling is easier when

(1) two magnetic layers are polarised in the same direction.
(2) two magnetic layers are polarised in the opposite directions.
(3) two aluminium-oxide barriers are polarised in the same direction.
(4) two aluminium-oxide barriers are polarised in opposite directions

20. A major barrier on the way to build a full-scale memory chip based on MTJs is

(1) the low sensitivity of the magnetic memory elements.
(2) the thickness of aluminium oxide barriers.
(3) the need to develop more reliable and far smaller magnetic memory chips.
(4) all of the above.

21. In the MTJs approach, it is possible to identify whether the topmost layer of the magnetised memory element is storing a zero or one by

(1) measuring an element's resistance and thus determining its magnetic orientation.
(2) measuring the degree of disruption caused by radiation in the elements of the magnetic memory.
(3) magnetising the elements either clockwise or anti-clockwise.
(4) measuring the current that flows through the sandwich.

22. A line of research which is trying to build a magnetic chip that can both store and manipulate information, is being pursued by

(1) Paul Freitas
(2) Stuart Parkin
(3) Gary Prinz
(4) None of these

23. Experimental research currently underway, using rows of magnetic dots, each of which could be polarised in one of the two directions, has led to the demonstration of

(1) working of a microprocessor.
(2) working of a logic gate.
(3) working of a magneto-resistance based chip.
(4) working of a magneto tunnelling-junction (MTJ) based chip.

24. From the passage, which of the following cannot be inferred?

(1) Electronic memory chips are faster and non-volatile.
(2) Electronic and magnetic storage technologies play a complementary role.
(3) MTJs are the more promising idea, compared to the magneto-resistance approach.
(4) Non-volatile Electronics is the company set up to commercialise the GMR chips.

Instructions for questions 25 - 32:
The passage given below is followed by questions. Choose the best answer for each question.

The story begins as the European pioneers crossed the Alleghenies and started to settle in the Midwest. The land they found was covered with forests. With incredible effort they felled the trees, pulled the stumps and planted their crops in the rich, loamy soil. When they finally reached the western edge of the place we now call Indiana, the forest stopped and ahead lay a thousand miles of the great grass prairie. The Europeans were puzzled by this new environment. Some even called it the "Great Desert". It seemed untillable. The earth was often very wet and it was covered with centuries of tangled and matted grasses. With their cast iron plows, the settlers found that the prairie sod could not be cut and the wet earth stuck to their plowshares. Even a team of the best oxen bogged down after a few years of tugging. The iron plow was a useless tool to farm the prairie soil. The pioneers were stymied for nearly two decades. Their western march was halted and they filled in the eastern regions of the Midwest.

In 1837, a blacksmith in the town of Grand Detour, Illinois, invented a new tool. His name was John Deere and the tool was a plow made of steel. It was sharp enough to cut through matted grasses and smooth enough to cast off the mud. It was a simple tool, the "sod buster" that opened the great prairies to agricultural development.

Sauk County, Wisconsin is the part of that prairie where I have a home. It is named after the Sauk Indians. In 1673, Father Marquette was the first European to lay his eyes upon their land. He found a village laid out in regular patterns on a plain beside the Wisconsin River. He called the place Prairie du Sac. The village was surrounded by fields that had provided maize, beans and squash for the Sauk people for generations reaching back into the unrecorded time.

When the European settlers arrived at the Sauk prairie in 1837, the government forced the native Sauk people west of the Mississippi River. The settlers came with John Deere's new invention and used the tool to open the area to a new kind of agriculture. They ignored the traditional ways of the Sauk Indians and used their sod-busting tool for planting wheat. Initially, the soil was generous and the farmers thrived. However, each year the soil lost more of its nurturing power. It was only thirty years after the Europeans arrived with their new technology that the land was depleted. Wheat farming became uneconomic and tens of thousands of farmers left Wisconsin seeking new land with sod to bust.

It took the Europeans and their new technology just one generation to make their homeland into a desert. The Sauk Indians who knew how to sustain themselves on the Sauk prairie land were banished to another kind of desert called a reservation. And they even forgot about the techniques and tools that had sustained them on the prairie for generations unrecorded. And that is how it was that three deserts were created- Wisconsin, the reservation and the memories of a people. A century later, the land of the Sauks is now populated by the children of a second wave of European farmers who learned to replenish the soil through the regenerative powers of dairying, ground cover crops and animal manures. These third and fourth generation farmers and townspeople do not realise, however, that a new settler is coming soon with an invention as powerful as John Deere's plow.

The new technology is called 'bereavement counselling'. It is a tool forged at the great state university, an innovative technique to meet the needs of those experiencing the death of a loved one, a tool that can "process" the grief of the people who now live on the Prairie of the Sauk. As one can imagine the final days of the village of the Sauk Indians before the arrival of the settlers with John Deere's plow, one can also imagine these final days before the arrival of the first bereavement counsellor at Prairie du Sac. In these final days, the farmers and the townspeople mourn at the death of a mother, brother, son or friend. The bereaved is joined by neighbours and kin. They meet grief together in lamentation, prayer and song. They call upon the words of the clergy and surround themselves in community.

It is in these ways that they grieve and then go on with life. Through their mourning they are assured of

the bonds between them and renewed in the knowledge that this death is a part of the Prairie of the Sauk. Their grief is common property, anguish from which the community draws strength and gives the bereaved the courage to move ahead.

It is into this prairie community that the bereavement counsellor arrives with the new grief technology. The counsellor calls the invention a service and assures the prairie folk of its effectiveness and superiority by invoking the name of the great university while displaying a diploma and certificate. At first, we can imagine that the local people will be puzzled by the bereavement counsellor's claim. However, the counsellor will tell a few of them that the new technique is merely to assist the bereaved's community at the time of death. To some other prairie folk who are isolated or forgotten, the counsellor will approach the County Board and advocate the right to treatment for these unfortunate souls. This right will be guaranteed by the Board's decision to reimburse those too poor to pay for counselling services. There will be others, schooled to believe in the innovative new tools certified by universities and medical centres, who will seek out the bereavement counsellor by force of habit. And one of these people will tell a bereaved neighbour who is unschooled that unless his grief is processed by a counsellor, he will probably have major psychological problems in later life. Several people will begin to use the bereavement counsellor because, since the County Board now taxes them to insure access to the technology, they will feel that to fail to be counselled is to waste their money, and to be denied a benefit, or even a right.

Finally, one day, the aged father of a Sauk woman will die. And the next door neighbour will not drop by because he doesn't want to interrupt the bereavement counsellor. The woman's kin will stay home because they will have learned that only the bereavement counsellor knows how to process grief the proper way. The local clergy will seek technical assistance from the bereavement counsellor to learn the correct form of service to deal with guilt and grief. And the grieving daughter will know that it is the bereavement counsellor who really cares for her because only the bereavement counsellor comes when death visits this family on the Prairie of the Sauk.

It will be only one generation between the bereavement counsellor arrives and the community of mourners disappears. The counsellor's new tool will cut through the social fabric, throwing aside kinship, care, neighbourly obligations and community ways of coming together and going on. Like John Deere's plow, the tools of bereavement counselling will create a desert where a community once flourished. And finally, even the bereavement counsellor will see the impossibility of restoring hope in clients once they are genuinely alone with nothing but a service for consolation. In the inevitable failure of the service, the bereavement counsellor will find the deserts even in herself.

25. Which one of the following best describes the approach of the author?

(1) Comparing experiences with two innovations tried, in order to illustrate the failure of both.
(2) Presenting community perspectives on two technologies which have had negative effects on people.
(3) Using the negative outcomes of one innovation to illustrate the likely outcomes of another innovation.
(4) Contrasting two contexts separated in time, to illustrate how 'deserts' have arisen.

26. According to the passage, bereavement handling traditionally involves

(1) the community bereavement counsellors working with the bereaved to help him/her overcome grief.
(2) the neighbours and kin joining the bereaved and meeting grief together in mourning and prayer.
(3) using techniques developed systematically in formal institutions of learning, a trained counsellor helping the bereaved cope with grief.
(4) the Sauk Indian Chief leading the community with rituals and rites to help lessen the grief of the bereaved.

27. Due to which of the following reasons, according to the author, will the bereavement counsellor find the deserts even in herself?

(1) Over a period of time, working with Sauk Indians who have lost their kinship and relationships, she becomes one of them.
(2) She is working in an environment where the disappearance of community mourners makes her work place a social desert.
(3) Her efforts at grief processing with the bereaved will fail as no amount of professional service can make up for the loss due to the disappearance of community mourners.
(4) She has been working with people who have settled for a long time in the Great Desert.

28. According to the author, the bereavement counsellor is

(1) a friend of the bereaved helping him or her handle grief.
(2) an advocate of the right to treatment for the community.
(3) a kin of the bereaved helping him/her handle grief.
(4) a formally trained person helping the bereaved handle grief.

29. The Prairie was a great puzzlement for the European pioneers because

(1) it was covered with thick, untillable layers of grass over a vast stretch.
(2) it was a large desert immediately next to lush forests.
(3) it was rich cultivable land left fallow for centuries.
(4) it could be easily tilled with iron plows.

30. Which of the following does the 'desert' in the passage refer to?

(1) Prairie soil depleted by cultivation of wheat.
(2) Reservations in which native Indians were resettled.
(3) Absence of, and emptiness in, community kinship and relationships.
(4) All of the above.

31. According to the author, people will begin to utilise the service of the bereavement counsellor because

(1) new County regulations will make them feel it is a right, and if they don't use it, it would be a loss.
(2) the bereaved in the community would find her a helpful friend.
(3) she will fight for subsistence allowance from the County Board for the poor among the bereaved.
(4) grief processing needs tools certified by universities and medical centres.

32. Which one of the following parallels between the plow and bereavement counselling is not claimed by the author?

(1) Both are innovative technologies.
(2) Both result in migration of the communities into which the innovations are introduced.
(3) Both lead to 'deserts' in the space of only one generation.
(4) Both are tools introduced by outsiders entering existing communities.

Instructions for questions 33 - 40:
The passage given below is followed by questions. Choose the best answer for each question.

The teaching and transmission of North Indian classical music is, and long has been, achieved by largely oral means. The raga and its structure, the often breathtaking intricacies of tala or rhythm, and the incarnation of raga and tala as bandish or composition, are passed thus, between guru and shishya by word of mouth and direct demonstration, with no printed sheet of notated music, as it were, acting as a go-between. Saussure's conception of language as a communication between addresser and addressee is given, in this model, a further instance, and a new exotic complexity and glamour.

These days, especially with the middle class having entered the domain of classical music and playing not a small part in ensuring the continuation of this ancient tradition, the tape recorder serves as a handy technological slave and preserves, from oblivion, the vanishing, elusive moment of oral transmission. Hoary gurus, too, have seen the advantage of this device, and increasingly use it as an aid to instructing their pupils; in place of the shawls and other traditional objects that used to pass from shishya to guru in the past, as a token of the regard of the former for the latter, it is not unusual, today, to see cassettes changing hands.

Part of my education in North Indian classical music was conducted via this rather ugly but beneficial rectangle of plastic, which I carried with me to England when I was an undergraduate. One cassette had stored in it various talas played upon the tabla, at various tempos, by my music teacher's brother-in-law, Hazarilalji, who was a teacher of Kathak dance, as well as a singer and a tabla player. This was a work of great patience and prescience, a one-and-a-half hour performance without any immediate point or purpose, but intended for some delayed future moment when I'd practise the talas solitarily.

This repeated playing out of the rhythmic cycles on the tabla was inflected by the noises- an irate auto driver blowing a horn; the sound of overbearing pigeons that were such a nuisance on the banister; even the cry of a kulfi seller in summer- entering from the balcony of the third floor flat we occupied in those days, in a lane in a Bombay suburb, before we left the city for good. These sounds, in turn, would invade, hesitantly, the ebb and flow of silence inside the artificially heated room, in a borough of West London, in which I used to live as an undergraduate. There, in the trapped dust, silence and heat, the theka of the tabla, qualified by the imminent but intermittent presence of the Bombay suburb, would come to life again. A few years later, the tabla and, in the background, the pigeons and the itinerant kulfi seller, would inhabit a small graduate room in Oxford.

The tape recorder, though, remains an extension of the oral transmission of music, rather than a replacement of it. And the oral transmission of North Indian classical music remains, almost uniquely, a testament to the fact that the human brain can absorb, remember and reproduce structures of great complexity and sophistication without the help of the hieroglyph or written mark or a system of notation. I remember my surprise on discovering that Hazarilalji-who had mastered Kathak dance, tala and North Indian classical music, and who used to narrate to me, occasionally, compositions meant for dance that were grand and intricate in their verbal prosody, architecture and rhythmic complexity- was near illiterate and had barely learnt to write his name in large and clumsy letters.

Of course, attempts have been made, throughout the 20th century, to formally codify and even notate this music, and institutions set up and degrees created, specifically to educate students in this "scientific" and codified manner. Paradoxically, however, this style of teaching has produced no noteworthy student or performer; the most creative musicians still emerge from the guru-shishya relationship, their understanding of music developed by oral communication.

The fact that North Indian classical music emanates from, and has evolved through, oral culture, means that this music has a significantly different aesthetic, and that this aesthetic has a different politics, from that of Western classical music. A piece of music in the Western tradition, at least in its most characteristic and popular conception, originates in its composer, and the connection between the two, between composer and the piece of music, is relatively unambiguous precisely because the composer writes down, in notation, his composition, as a poet might write down and publish his poem. However far the printed sheet of notated music might travel thus from the composer, it still remains his property; and the notion of property remains at the heart of the Western conception of "genius", which derives from the Latin gignere or 'to beget'.

The genius in Western classical music is, then, the originator, begetter and owner of his work-the printed, notated sheet testifying to his authority over his product and his power, not only of expression or imagination, but of origination. The conductor is a custodian and guardian of this property. Is it an

accident that Mandelstam, in his notebooks, compares- celebratorily- the conductor's baton to a policeman's, saying all the music of the orchestra lies mute within it, waiting for its first movement to release it into the auditorium?

The raga-transmitted through oral means is, in a sense, no one's property; it is not easy to pin down its source, or to know exactly where its provenance or origin lies. Unlike the Western classical tradition, where the composer begets his piece, notates it and stamps it with his ownership and remains, in effect, larger than, or the father of, his work, in the North Indian classical tradition, the raga-unconfined to a single incarnation, composer or performer-remains necessarily greater than the artiste who invokes it.

This leads to a very different politics of interpretation and valuation, to an aesthetic that privileges the evanescent moment of performance and invocation over the controlling authority of genius and the permanent record. It is a tradition, thus, that would appear to value the performer, as medium, more highly than the composer who presumes to originate what, effectively, cannot be originated in a single person- because the raga is the inheritance of a culture.

33. The author's contention that the notion of property lies at the heart of the Western conception of genius is best indicated by which one of the following?

(1) The creative output of a genius is invariably written down and recorded.
(2) The link between the creator and his output is unambiguous.
(3) The word "genius" is derived from a Latin word which means "to beget."
(4) The music composer notates his music and thus becomes the "father" of a particular piece of music.

34. Saussure's conception of language as a communication between addresser and addressee, according to the author, is exemplified by the

(1) teaching of North Indian classical music by word of mouth and direct demonstration.
(2) use of the recorded cassette as a transmission medium between the music teacher and the trainee.
(3) written down notation sheets of musical compositions.
(4) conductor's baton and the orchestra.

35. The author holds that the "rather ugly but beneficial rectangle of plastic" has proved to be a "handy technological slave" in

(1) storing the talas played upon the tabla, at various tempos.
(2) ensuring the continuance of an ancient tradition.
(3) transporting North Indian classical music across geographical borders.
(4) capturing the transient moment of oral transmission.

36. The oral transmission of North Indian classical music is an almost unique testament of the

(1) efficacy of the guru-shishya tradition.
(2) earning impact of direct demonstration.
(3) brain's ability to reproduce complex structures without the help of written marks.
(4) the ability of an illiterate person to narrate grand and intricate musical compositions.

37. According to the passage, in the North Indian classical tradition, the raga remains greater than the artiste who invokes it. This implies an aesthetic which

(1) emphasises performance and invocation over the authority of genius and permanent record.
(2) makes the music no one's property.
(3) values the composer more highly than the performer.
(4) supports oral transmission of traditional music.

38. From the author's explanation of the notion that in the Western tradition, music originates in its composer, which one of the following cannot be inferred?

(1) It is easy to transfer a piece of Western classical music to a distant place.
(2) The conductor in the Western tradition, as a custodian, can modify the music, since it 'lies mute' in his baton.
(3) The authority of the Western classical music composer over his music product is unambiguous.
(4) The power of the Western classical music composer extends to the expression of his music.

39. According to the author, the inadequacy of teaching North Indian classical music through a codified, notation based system is best illustrated by

(1) a loss of the structural beauty of the ragas.
(2) a fusion of two opposing approaches creating mundane music.
(3) the conversion of free-flowing ragas into stilted set pieces.
(4) its failure to produce any noteworthy student or performer.

40. Which of the following statements best conveys the overall idea of the passage?

(1) North Indian and Western classical music are structurally different.
(2) Western music is the intellectual property of the genius while the North Indian raga is the inheritance of a culture.
(3) Creation as well as performance is important in the North Indian classical tradition.
(4) North Indian classical music is orally transmitted while Western classical music depends on written down notations.

Instructions for questions 41 - 45:
Sentences given in each question, when properly sequenced, form a coherent paragraph. The first and last sentences are 1 and 6, and the four in between are labelled A,B,C and D. Choose the most logical order of these four sentences from among the four given choices to construct a coherent paragraph from sentences 1 to 6.

41.

1. Security inks exploit the same principle that causes the vivid and constantly changing colours of a film of oil on water.
A. When two rays of light meet each other after being reflected from these different surfaces, they have each travelled slightly different distances.
B. The key is that the light is bouncing off two surfaces, that of the oil and that of the water layer below it.
C. The distance the two rays travel determines which wavelengths, and hence colours, interfere constructively and look bright.
D. Because light is an electromagnetic wave, the peaks and troughs of each ray then interfere either constructively, to appear bright, or destructively, to appear dim.
6. Since the distance the rays travel changes with the angle as you look at the surface, different colours look bright from different viewing angles.

(1) ABCD (2) BADC
(3) BDAC (4) DCAB

42.

1. Commercially reared chicken can be unusually aggressive, and are often kept in darkened sheds to prevent them pecking at each other.
A. The birds spent far more of their time-up to a third-pecking at the inanimate objects in the pens, in contrast to birds in other pens which spent a lot of time attacking others.
B. In low light conditions, they behave less belligerently, but are more prone to ophthalmic disorders and respiratory problems.
C. In an experiment, aggressive head-pecking was all but eliminated among birds in the enriched environment.

D. Altering the birds' environment, by adding bales of wood-shavings to their pens, can work wonders.

6. Bales could diminish aggressiveness and reduce injuries; they might even improve productivity, since a happy chicken is a productive chicken.

(1) DCAB (2) CDBA
(3) DBAC (4) BDCA

43.

1. The concept of a 'nation-state' assumes a complete correspondence between the boundaries of the nation and the boundaries of those who live in a specific state.

A. Then there are members of national collectivities who live in other countries, making a mockery of the concept.

B. There are always people living in particular states who are not considered to be (and often do not consider themselves to be) members of the hegemonic nation.

C. Even worse, there are nations which never had a state or which are divided across several states.

D. This, of course, has been subject to severe criticism and is virtually everywhere a fiction.

6. However, the fiction has been, and continues to be, at the basis of nationalist ideologies.

(1) DBAC (2) ABCD
(3) BACD (4) DACB

44.

1. In the sciences, even questionable examples of research fraud are harshly punished.

A. But no such mechanism exists in the humanities-much of what humanities researchers call, research does not lead to results that are replicable by other scholars.

B. Given the importance of interpretation in historical and literary scholarship, humanities researchers are in a position where they can explain away deliberate and even systematic distortion.

C. Mere suspicion is enough for funding to be cut off; publicity guarantees that careers can be effectively ended.

D. Forgeries which take the form of pastiches in which the forger intersperses fake and real parts can be defended as mere mistakes or aberrant misreading.

6. Scientists fudging data have no such defences.

(1) BDCA (2) ABDC
(3) CABD (4) CDBA

45.

1. Horses and communism were, on the whole, a poor match.

A. Fine horses bespoke the nobility the party was supposed to despise.

B. Communist leaders, when they visited villages, preferred to see cows and pigs.

C. Although a working horse was just about tolerable, the communists were right to be wary.

D. Peasants from Poland to the Hungarian Pustza preferred their horses to party dogma.

6. 'A farmer's pride is his horse; his cow may be thin but his horse must be fat,' went a Slovak saying.

(1) ACDB (2) DBCA
(3) ABCD (4) DCBA

46. Though one eye is kept firmly on the _____, the company now also promotes _____ contemporary art.

A. present, experimental
B. future, popular
C. present, popular
D. market, popular

47. The law prohibits a person from felling a sandalwood tree, even if it grows on one's own land, without prior permission from the government. As poor people cannot deal with the government, this legal provision leads to a rip-roaring business for _____, who care neither for the _____, nor for the trees.

A. middlemen, rich
B. the government, poor
C. touts, rich
D. touts, poor

Instructions for questions 48 - 50:
In each of the following sentences, parts of the sentence are left blank. Beneath each sentence, different ways of completing the sentence are indicated. Choose the best alternative among them.

48. It will take some time for many South Koreans to _____ the conflicting images of North Korea, let alone to _____ what to make of their northern cousins.

(1) reconcile, decide
(2) understand, clarify
(3) make out, decide
(4) reconcile, understand

49. In these bleak and depressing times of _____ prices, non-performing governments and _____ crime rates, Sourav Ganguly has given us, Indians, a lot to cheer about.

(1) escalating, increasing
(2) spiralling, booming
(3) spiralling, soaring
(4) ascending, debilitating

50. The manners and _____ of the nouveau riche is a recurrent _____ in literature.

(1) style, motif (2) morals, story
(3) wealth, theme (4) morals, theme

51.

A. If caught in the act, they were punished, not for the crime, but for allowing themselves to be caught another lash of the whip.
B. The bellicose Spartans sacrificed all the finer things in life for military expertise.
C. Those fortunate enough to survive babyhood were taken away from their mothers at the age of seven to undergo rigorous military training.
D. This consisted mainly of beatings and deprivations of all kinds like going around barefoot in winter, and worse, starvation so that they would be forced to steal food to survive.
E. Male children were examined at birth by the city council and those deemed too weak to become soldiers were left to die of exposure.

(1) BECDA (2) ECADB
(3) BCDAE (4) ECDAB

52.

A. This very insatiability of the photographing eye changes the terms of confinement in the cave, our world.
B. Humankind lingers unregenerately in Plato's cave, still revelling its age-old habit, in mere images of truth.
C. But being educated by photographs is not like being educated by older images drawn by hand; for one thing, there are a great many more images around, claiming our attention.
D. The inventory started in 1839 and since then just about everything has been photographed, or so it seems.
E. In teaching us a new visual code, photographs alter and enlarge our notions of what is worth looking at and what we have a right to observe.

(1) EABCD (2) BDEAC
(3) BCDAE (4) ECDAB

53.

A. To be culturally literate is to possess the basic information needed to thrive in the modern world.
B. Nor is it confined to one social class; quite the contrary.
C. It is by no means confined to "culture" narrowly understood as an acquaintance with the arts.
D. Cultural literacy constitutes the only sure avenue of opportunity for disadvantaged children, the only reliable way of combating

the social determinism that now condemns them.

E. The breadth of that information is great, extending over the major domains of human activity from sports to science.

(1) AECBD (2) DECBA
(3) ACBED (4) DBCAE

54.

A. Both parties use capital and labour in the struggle to secure property rights.
B. The thief spends time and money in his attempt to steal (he buys wire cutters) and the legitimate property owner expends resources to prevent the theft (he buys locks).
C. A social cost of theft is that both the thief and the potential victim use resources to gain or maintain control over property.
D. These costs may escalate as a type of technological arms race unfolds.
E. A bank may purchase more and more complicated and sophisticated safes, forcing safecrackers to invest further in safecracking equipment.

(1) ABCDE (2) CABDE
(3) ACBED (4) CBEDA

55.

A. The likelihood of an accident is determined by how carefully the motorist drives and how carefully the pedestrian crosses the street.
B. An accident involving a motorist and a pedestrian is such a case.
C. Each must decide how much care to exercise without knowing how careful the other is.
D. The simplest strategic problem arises when two individuals interact with each other, and each must decide what to do without knowing what the other is doing.

(1) ABCD (2) ADCB
(3) DBCA (4) DBAC

Section II

56. Let D be a recurring decimal of the form, D = $0.a_1a_2a_1a_2a_1a_2$ ....., where digits a_1 and a_2 lie between 0 and 9. Further, at most one of them is zero. Then which of the following numbers necessarily produces an integer, when multiplied by D?

(1) 18 (2) 108
(3) 198 (4) 288

57.

x	1	2	3	4	5	6
y	4	8	14	22	32	44

In the above table, for suitably chosen constants a, b and c, which one of the following best describes the relation between y and x?

(1) $y = a + bx$
(2) $y = a + bx + cx^2$
(3) $y = e^{a + bx}$
(4) None of the above

58. If $a_1 = 1$ and $a_{n+1} = 2a_n + 5$, $n = 1, 2 \ldots$, then a_{100} is equal to

(1) $(5 \times 2^{99} - 6)$ (2) $(5 \times 2^{99} + 6)$
(3) $(6 \times 2^{99} + 5)$ (4) $(6 \times 2^{99} - 5)$

59. What is the value of the following expression?

$$\frac{1}{2^2 - 1} + \frac{1}{4^2 - 1} + \frac{1}{6^2 - 1} + \ldots . + \frac{1}{20^2 - 1}$$

(1) $\frac{9}{19}$ (2) $\frac{10}{19}$
(3) $\frac{10}{21}$ (4) $\frac{11}{21}$

60. A truck travelling at 70 kilometres per hour uses 30% more diesel to travel a certain distance than it does when it travels at the speed of 50 kilometres per hour. If the truck can travel 19.5 kilometres on a litre of diesel at 50 kilometres per hour, how far can the truck travel on 10 litres of diesel at a speed of 70 kilometres per hour?

(1) 130 (2) 140
(3) 150 (4) 175

61. Consider a sequence of seven consecutive integers. The average of the first five integers is n. The average of all the seven integers is

(1) n
(2) $n + 1$
(3) K × n, where K is a function of n
(4) $n + \frac{2}{7}$

62. If $x > 2$ and $y > -1$, Then which of the following statements is necessarily true?

(1) $xy > -2$ (2) $-x < 2y$
(3) $xy < -2$ (4) $-x > 2y$

63. One red flag, three white flags and two blue flags are arranged in a line such that,

(A) no two adjacent flags are of the same colour.
(B) the flags at the two ends of the line are of different colours.

In how many different ways can the flags be arranged?

(1) 6 (2) 4
(3) 10 (4) 2

64. Let S be the set of integers x such that
(i) $100 \leq x \leq 200$
(ii) x is odd
(iii) x is divisible by 3 but not by 7
How many elements does S contain?

(1) 16 (2) 12
(3) 11 (4) 13

65. Let x, y and z be distinct integers, that are odd and positive. Which one of the following statements cannot be true?

(1) xyz^2 is odd.
(2) $(x - y)^2 z$ is even.
(3) $(x + y - z)^2 (x + y)$ is even.
(4) $(x - y) (y + z) (x + y - z)$ is odd.

66. Let S be the set of prime numbers greater than or equal to 2 and less than 100. Multiply all elements of S. With how many consecutive zeros will the product end?

(1) 1 (2) 4
(3) 5 (4) 10

67. What is the number of distinct triangles with integral valued sides and perimeter 14?

(1) 6 (2) 5
(3)4 (4)3

68. Let $N = 1421 \times 1423 \times 1425$. What is the remainder when N is divided by 12?

(1) 0 (2) 9
(3) 3 (4) 6

69. The integers 34041 and 32506 when divided by a three-digit integer 'n' leave the same remainder. What is 'n'?

(1) 289 (2) 367
(3) 453 (4) 307

70. Each of the numbers $x_1, x_2...., x_n, n > 4$, is equal to 1 or –1. Suppose,

$x_1x_2x_3x_4 + x_2x_3x_4x_5 + x_3x_4x_5x_6 + ...+ x_{n-3}x_{n-2}x_{n-1}x_n + x_{n-2}x_{n-1}x_nx_1 + x_{n-1}x_nx_1x_2 + x_nx_1x_2x_3 = 0$, then,

(1) (1)*n is even.*
(2) n is odd.
(3) n is an odd multiple of 3.
(4) (4)*n is prime*

71. The table below shows the age-wise distribution of the population of Reposia. The number of people aged below 35 years is 400 million.

Age Group	Percentage
Below 15 years	30.00
15 - 24	17.75
25 - 34	17.00
35 - 44	14.50
45 - 54	12.50
55 - 64	7.10
65 and above	1.15

If the ratio of females to males in the 'below 15 years' age group is 0.96, then what is the number of females (in millions) in that age group?

(1) 82.8 (2) 90.8
(3) 80.0 (4) 90.0

72. Sam has forgotten his friend's seven-digit telephone number. He remembers the following: the first three digits are either 635 or 674, the number is odd, and the number nine appears once. If Sam were to use a trial and error process to reach his friend, what is the minimum number of trials he has to make before he can be certain to succeed?

(1) 1000 (2) 2430
(3) 3402 (4) 3006

Instructions for questions 73 - 74:
A, B, C are three numbers. Let

@ (A, B) = average of A and B,

/ (A, B) = product of A and B, and

X (A, B) = the result of dividing A by B

73. The sum of A and B is given by

(1) /(@(A, B), 2) (2) X(@(A, B), 2)
(3) @(/(A, B), 2) (4) @(X(A, B), 2)

74. Average of A, B and C is given by

(1) @(/(@(/(B, A), 2), C), 3)
(2) X(@(/(@(B, A), 3), C), 2)
(3) /(@(X(@(B, A), 2), C), 3)
(4) /(X(@(/(@(B, A), 2), C), 3), 2)

Instructions for questions 75 – 76:
Answer the following questions based on the information given below.

For real numbers x, y, let

$f(x, y)$ = Positive square-root of $(x + y)$, if $(x + y)^{0.5}$ is real
= $(x + y)^2$, otherwise

$g(x, y) = (x + y)^2$, if $(x + y)^{0.5}$ is real
= $-(x + y)$, otherwise

75. Which of the following expressions yields a positive value for every pair of non-zero real number (x, y)?

(1) $f(x, y) - g(x, y)$
(2) $f(x, y) - (g(x, y))^2$
(3) $g(x, y) - (f(x, y))^2$
(4) $f(x, y) + g(x, y)$

76. Under which of the following conditions is $f(x, y)$ necessarily greater than $g(x, y)$?

(1) Both x and y are less than –1
(2) Both x and y are positive
(3) Both x and y are negative
(4) $y > x$

Instructions for questions 77 – 79:
Answer the following questions based on the information given below.

For three distinct real numbers x, y and z, let

$f(x, y, z) = \min(\max(x, y), \max(y, z), \max(z, x))$

$g(x, y, z) = \max(\min(x, y), \min(y, z), \min(z, x))$

$h(x, y, z) = \max(\max(x, y), \max(y, z), \max(z, x))$

$j(x, y, z) = \min(\min(x, y), \min(y, z), \min(z, x))$

$m(x, y, z) = \max(x, y, z)$

$n(x, y, z) = \min(x, y, z)$

77. Which of the following is necessarily greater than 1?

(1) $(h(x, y, z) - f(x, y, z))/j(x, y, z)$
(2) $j(x, y, z)/h(x, y, z)$
(3) $f(x, y, z)/g(x, y, z)$
(4) $(f(x, y, z) + h(x, y, z) - g(x, y, z))/j(x, y, z)$

78. Which of the following expressions is necessarily equal to 1?

(1) $(f(x, y, z) - m(x, y, z))/(g(x, y, z) - h(x, y, z))$
(2) $(m(x, y, z) - f(x, y, z))/(g(x, y, z) - n(x, y, z))$
(3) $(j(x, y, z) - g(x, y, z))/h(x, y, z)$
(4) $(f(x, y, z) - h(x, y, z))/f(x, y, z)$

79. Which of the following expressions is indeterminate?

(1) $(f(x, y, z) - h(x, y, z))/(g(x, y, z) - j(x, y, z))$

(2) $(f(x, y, z) + h(x, y, z) + g(x, y, z) + j(x, y, z))/$
$(j(x, y, z) + h(x, y, z) - m(x, y, z) - n(x, y, z))$

(3) $(g(x, y, z) - j(x, y, z))/(f(x, y, z) - h(x, y, z))$

(4) $(h(x, y, z) - f(x, y, z))/(n(x, y, z) - g(x, y, z))$

Instructions for questions 80 and 81*: Answer the following questions based on the information given below.*

There are five machines A, B C, D and E situated on a straight line at distances of 10 metres, 20 metres, 30 metres, 40 metres and 50 metres respectively from the origin of the line. A robot is stationed at the origin of the line. The robot serves the machines with raw material whenever a machine becomes idle. All the raw material is located at the origin. The robot is in an idle state at the origin at the beginning of a day. As soon as one or more machines become idle, they send messages to the robot-station and the robot starts and serves all the machines from which it received messages. If a message is received at the station while the robot is away from it, the robot takes notice of the message only when it returns to the station. While moving, it serves the machines in the sequence in which they are encountered, and then returns to the origin. If any messages are pending at the station when it returns, it repeats the process again. Otherwise, it remains idle at the origin till the next message(s) is received.

80. Suppose on a certain day, machines A and D have sent the first two messages to the origin at the beginning of the first second, and C has sent a message at the beginning of the 5th second and B at the beginning of the 6th second, and E at the beginning of the 10th second. How much distance in metres has the robot travelled since the beginning of the day, when it notices the message of E? Assume that the speed of movement of the robot is 10 metres per second.

(1) 140 (2) 80
(3) 340 (4) 360

81. Suppose there is a second station with raw material for the robot at the other extreme of the line which is 60 metres from the origin, that is, 10 metres from E. After finishing the services in a trip, the robot returns to the nearest station. If both stations are equidistant, it chooses the origin as the station to return to. Assuming that both stations receive the messages sent by the machines and that all the other data remains the same, what would be the answer to the above question?

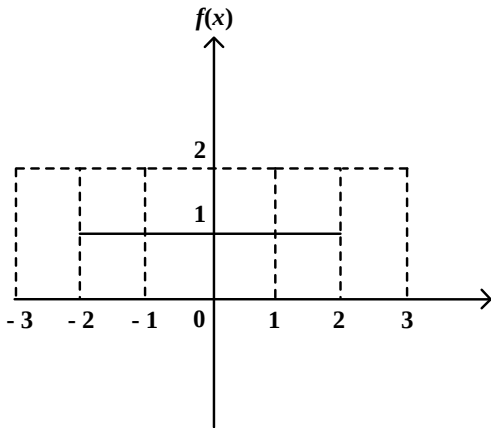
(1) 120 (2) 140
(3) 340 (4) 70

Instructions for questions 82 to 84: *Answer the following questions based on the information given below.*

Given below are three graphs made up of straight-line segments shown as thick lines. In each case choose the answer as

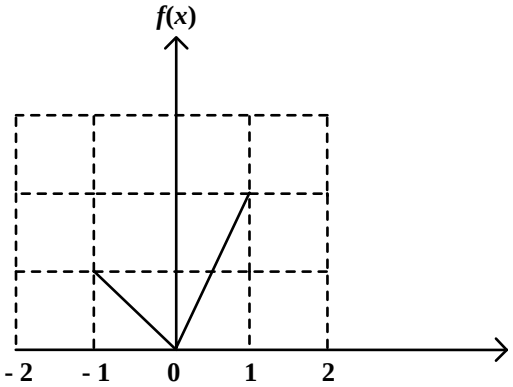
1. if $f(x) = 3\,f(-x)$;
2. if $f(x) = -f(-x)$;
3. if $f(x) = f(-x)$; and
4. if $3\,f(x) = 6\,f(-x)$, for $x \geq 0$.

82.



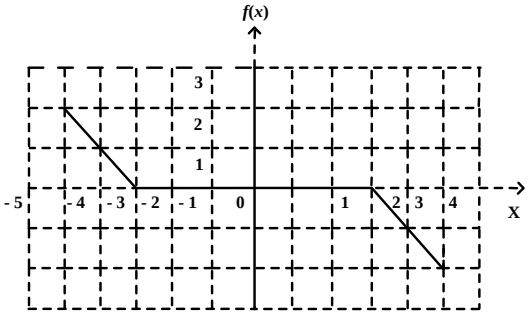
(1) 1 (2) 2
(3) 3 (4) 4

83.



(1) 1 (2) 2
(3) 3 (4) 4

84.



(1) 1 (2) 2
(3) 3 (4) 4

Instructions for questions 85 and 86: Answer the following questions based on the information given below.

There are three bottles of water, A, B, C, whose capacities are 5 litres, 3 litres, and 2 litres respectively. For transferring water from one bottle to another and to drain out the bottles, there exists a piping system. The flow thorough these pipes is computer controlled. The computer that controls the flow through these pipes can be fed with three types of instructions, as explained below:

Instruction type	Explanation of the instruction
FILL (*X, Y*)	Fill bottle labelled *X* from the water in bottle labelled *Y,* where the remaining capacity of *X* is less than or equal to the amount of water in *Y*.
EMPTY (*X, Y*)	Empty out the water in bottle labelled *X* into bottle labelled *Y*, where the amount of water in *X* is less than or equal to remaining capacity of *Y*.
DRAIN (*X*)	Drain out all the water contained in bottle labelled *X*.

Initially, A is full with water, and B and C are empty.

85. After executing a sequence of three instructions, bottle A contains one litre of water. The first and the third of these instructions are shown below
First instruction FILL (C, A)
Third instruction FILL (C, A)

Then which of the following statements about the instructions is true?

(1) The second instruction is FILL (B, A)
(2) The second instruction is EMPTY (C, B)
(3) The second instruction transfers water from B to C
(4) The second instruction involves using the water in bottle A.

86. Consider the same sequence of three instructions and the same initial state mentioned above. Three more instructions are added at the end of the above sequence to have A contain 4 litres of water. In this total sequence of six instructions, the fourth one is DRAIN (A). This is the only DRAIN instruction in the entire sequence. At the end of the execution of the above sequence, how much water (in litres) is contained in C?

(1) One (2) Two
(3) Zero (4) None of these

Instructions for questions 87 and 88: Answer the following questions based on the information given below.

For a real number *x*, let

$f(x) = 1/(1 + x)$, if *x* is non-negative
$= 1 + x$, if *x* is negative

$f^n(x) = f(f^{n-1}(x))$, $n = 2, 3, ...$

87. What is the value of the product, $f(2)f^2(2)f^3(2)f^4(2)f^5(2)$?

(1) $\frac{1}{3}$ (2) 3
(3) $\frac{1}{18}$ (4) None of these

88. *r* is an integer ≥ 2. Then, what is the value of $f^{r-1}(-r) + f^r(-r) + f^{r+1}(-r)$?

(1) -1 (2) 0
(3) 1 (4) None of these

Instructions for questions 89 to 93: Answer the following questions based on the information given below.

Sixteen teams have been invited to participate in the ABC Gold Cup cricket tournament. The tournament is conducted in two stages. In the first stage, the teams are divided into two groups. Each group consists of eight teams, with each team playing every other team in its group exactly once. At the end of the first stage, the top four teams from each group advance to the second stage while the rest are eliminated. The second stage comprises of several rounds. A round involves one match for each team. The winner of a match in a round advances to the next round, while the loser is eliminated. The team that remains undefeated in the second stage is declared the winner and claims the Gold Cup.
The tournament rules are such that each match results in a winner and a loser with no possibility of a tie. In the first stage, a team earns one point for each win and no points for a loss. At the end of the first stage teams in each group are ranked on the basis of total points to determine the qualifiers advancing to the next stage. Ties are resolved by a series of

complex tie-breaking rules so that exactly four teams from each group advance to the next stage.

89. What is the total number of matches played in the tournament?

(1) 28 (2) 55
(3) 63 (4) 35

90. The minimum number of wins needed for a team in the first stage to guarantee its advancement to the next stage is

(1) 5 (2) 6
(3) 7 (4) 4

91. What is the highest number of wins for a team in the first stage in spite of which it would be eliminated at the end of first stage?

(1) 1 (2) 2
(3) 3 (4) 4

92. What is the number of rounds in the second stage of the tournament?

(1) 1 (2) 2
(3) 3 (4) 4

93. Which of the following statements is true?

(1) The winner will have more wins than any other team in the tournament.
(2) At the end of the first stage, no team eliminated from the tournament will have more wins than any of the teams qualifying for the second stage.
(3) It is the possible that the winner will have the same number of wins in the entire tournament as a team eliminated at the end of the first stage.
(4) The number of teams with exactly one win in the second stage of the tournament is 4.

94. Let $N = 55^3 + 17^3 - 72^3$. N is divisible by

(1) both 7 and 13 (2) both 3 and 13
(3) both 17 and 7 (4) both 3 and 17

95. If $x^2 + y^2 = 0.1$ and $|x - y| = 0.2$, then $|x| + |y|$ is equal to

(1) 0.3 (2) 0.4
(3) 0.2 (4) 0.6

96. ABCD is a rhombus with the diagonals AC and BD intersecting at the origin on the x-y plane. The equation of the straight line AD is $x + y = 1$. What is the equation of BC?

(1) $x + y = -1$
(2) $x - y = -1$
(3) $x + y = 1$
(4) None of the above

97. Consider a circle with unit radius. There are 7 adjacent sectors, S_1, S_2, S_3,...., S_7 in the circle such that their total area is $(1/8)^{th}$ of the area of the circle. Further, the area of the j^{th} sector is twice that of the $(j-1)^{th}$ sector, for $j = 2, ..., 7$. What the angle, in radians, subtended by the arc of S_1 at the centre of the circle?

(1) $\frac{\pi}{508}$ (2) $\frac{\pi}{2040}$
(3) $\frac{\pi}{1016}$ (4) $\frac{\pi}{1524}$

98. There is a vertical stack of books marked 1, 2, and 3 on Table-A, with 1 at the bottom and 3 on top. These are to be placed vertically on Table-B with 1 at the bottom and 2 on the top, by making a series of moves from one table to the other. During a move, the topmost book, or the topmost two books, or all the three, can be moved from one of the tables to the other. If there are any books on the other table, the stack being transferred should be placed on top of the existing books, without changing the order of books in the stack that is being moved in that move. If there are no books on the other table, the stack is simply placed on the other table without disturbing the order of books in it. What is the minimum number of moves in which the above task can be accomplished?

(1) One (2) Two

(3) Three (4) Four

99. The area bounded by the three curves $|x + y| = 1$, $|x| = 1$, and $|y| = 1$, is equal to

(1) 4 (2) 3
(3) 2 (4) 1

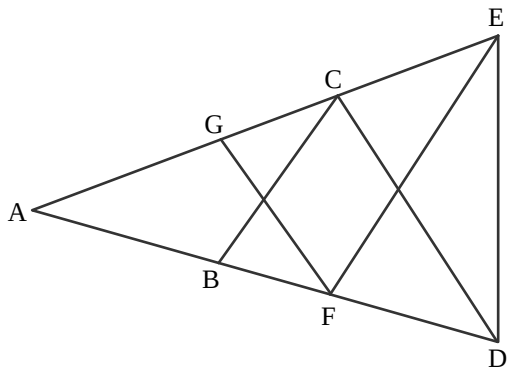
100. If the equation $x^3 - ax^2 + bx - a = 0$ has three real roots, then it must be the case that,

(1) $b = 1$ (2) $b \neq 1$
(3) $a = 1$ (4) $a \neq 1$

101. If a, b, c are the sides of a triangle, and $a^2 + b^2 + c^2 = bc + ca + ab$, then the triangle is

(1) equilateral (2) isosceles
(3) right angled (4) obtuse angled

102.



In the figure above, AB = BC = CD = DE = EF = FG = GA. Then ∠DAE is approximately

(1) 15° (2) 20°
(3) 30° (4) 25°

103. A shipping clerk has five boxes of different but unknown weights each weighing less than 100 kg. The clerk weighs the boxes in pairs. The weights obtained are 110, 112, 113, 114, 115, 116, 117, 118, 120 and 121 kg. What is the weight, in kg, of the heaviest box?

(1) 60 (2) 62
(3) 64 (4) Cannot be determined

104. There are three cities A, B and C, each of these cities is connected with the other two cities by at least one direct road. If a traveller wants to go from one city (origin) to another city (destination), she can do so either by traversing a road connecting the two cities directly, or by traversing two roads, the first connecting the origin to the third city and the second connecting the third city to the destination. In all there are 33 routes from A to B (including those via C). Similarly there are 23 routes from B to C (including those via A). How many roads are there from A to C directly?

(1) 6 (2) 3
(3) 5 (4) 10

105. The set of all positive integers is the union of two disjoint subsets

$\{f(1), f(2) \ldots f(n), \ldots\}$ and $\{g(1), g(2), \ldots, g(n), \ldots\}$, where

$f(1) < f(2) < \ldots < f(n) \ldots$, and $g(1) < g(2) < \ldots < g(n) \ldots$, and

$g(n) = f(f(n)) + 1$ for all $n \geq 1$.

What is the value of $g(1)$?

(1) Zero (2) Two
(3) One (4) Cannot be determined

106. ABCDEFGH is a regular octagon. A and E are opposite vertices of the octagon. A frog starts jumping from vertex to vertex, beginning from A. From any vertex of the octagon except E, it may jump to either of the two adjacent vertices. When it reaches E, the frog stops and stays there. Let a_n be the number of distinct paths of exactly n jumps ending in E. Then what is the value of a_{2n-1}?

(1) Zero (2) Four
(3) $2n - 1$ (4) Cannot be determined

107. For all non-negative integers x and y, $f(x, y)$ is defined as below
$f(0, y) = y + 1$
$f(x + 1, 0) = f(x, 1)$
$f(x + 1, y + 1) = f(x, f(x + 1, y))$
Then, what is the value of $f(1, 2)$?

(1) Two (2) Four
(3) Three (4) Cannot be determined

108. Convert the number 1982 from base 10 to base 12. The result is

(1) 1182 (2) 1912
(3) 1192 (4) 1292

109. Two full tanks, one shaped like a cylinder and the other like a cone, contain jet fuel. The cylindrical tank holds 500 litres more than the conical tank. After 200 litres of fuel has been pumped out from each tank the cylindrical tank contains twice the amount of fuel in the conical tank. How many litres of fuel did the cylindrical tank have when it was full?

(1) 700 (2) 1000
(3) 1100 (4) 1200

110. A farmer has decided to build a wire fence along one straight side of his property. For this, he planned to place several fence-posts at six metre intervals, with posts fixed at both ends of the side. After he bought the posts and wire, he found that the number of posts he had bought was five less than required. However, he discovered that the number of posts he had bought would be just sufficient if he spaced them eight metres apart. What is the length of the side of his property and how many posts did he buy?

(1) 100 metres, 15 (2) 100 metres, 16
(3) 120 metres, 15 (4) 120 metres, 16

Section III

111. In a recent report, the gross enrolment ratios at the primary level, that is, the number of children enrolled in classes one to five as a proportion of all children aged 6 to 10, were shown to be very high for most states; in many cases they were way above 100 percent! These figures are not worth anything, since they are based on the official enrolment data compiled from school records. They might as well stand for 'gross exaggeration ratios'.

Which one of the following options best supports the claim that the ratios are exaggerated?

(1) The definition of gross enrolment ratio does not exclude, in its numerator, children below 6 years or above 10 years enrolled in classes one to five.
(2) A school attendance study found that many children enrolled in the school records were not meeting a minimum attendance requirement of 80 percent.
(3) A study estimated that close to 22 percent of children enrolled in the class one records were below 6 years of age and still to start going to school.
(4) Demographic surveys show shifts in the population profile which indicate that the number of children in the age group 6 to 10 years is declining.

112. Szymanski suggests that the problem of racism in football may be present even today. He begins by verifying an earlier hypothesis that clubs' wage bills explain 90% of their performance. Thus, if players' salaries were to be only based on their abilities, clubs that spend more should finish higher. If there is pay discrimination against some group of players- fewer teams bidding for black players thus lowering the salaries for blacks with the same ability as whites- that neat relation may no longer hold. He concludes that certain clubs seem to have achieved much less than what they could have, by not recruiting black players.

Which one of the following findings would best support Szymanski's conclusion?

(1) Certain clubs took advantage of the situation by hiring above-average shares of black players.
(2) Clubs hired white players at relatively high wages and did not show proportionately good performance.
(3) During the study period, clubs in towns with a history of discrimination against blacks, under-performed relative to their wage bills.
(4) Clubs in one region, which had higher proportions of black players, had significantly lower wage bills than their counterparts in another region which had predominantly white players.

113. The pressure on Italy's 257 jails has been increasing rapidly. These jails are old and overcrowded. They are supposed to hold up to 43,000 people - 9,000 fewer than now. San Vittore in Milan, which has 1,800 inmates, is designed for 800. The number of foreigners inside jails has also been increasing. The minister in charge of prisons fears that tensions may snap, and so has recommended to the government an amnesty policy.

Which one of the following, if true, would have most influenced the recommendation of the minister?

(1) Opinion polls have indicated that many Italians favour a general pardon.
(2) The opposition may be persuaded to help since amnesties must be approved by a two third majority in the parliament.
(3) During a recent visit to a large prison, the pope, whose pronouncements are taken seriously, appealed for 'a gesture of clemency'.
(4) Shortly before the recommendation was made, 58 prisons reported disturbances in a period of two weeks.

114. The offer of the government to make iodised salt available at a low price of one rupee per kilo is welcome, especially since the government seems to be so concerned about the ill effects of non-iodised salt. But it is doubtful whether the offer will actually be implemented. Way back in 1994, the government, in an earlier effort, had prepared reports outlining three new and simple but experimental methods for reducing the costs of iodisation to about five paise per kilo. But these reports have remained just those- reports on paper.

Which one of the following, if true, most weakens the author's contention that it is doubtful whether the offer will be actually implemented?

(1) The government proposes to save on costs by using the three methods it has already devised for iodisation.
(2) The chain of fair-price distribution outlets now covers all the districts of the state.
(3) Many small-scale and joint-sector units have completed trials to use the three iodisation methods for regular production.
(4) The government which initiated the earlier effort is in place even today and has more information on the effects of noniodised salt.

115. About 96% of Scandinavian moths have ears tuned to the ultrasonic pulses that bats, their predators, emit. But the remaining 4% do not have ears and are deaf. However, they have a larger wingspan than the hearing moths, and also have higher wingloadings- the ratio between a wing's area and its weight- meaning higher maneuverability.

Which one of the following can be best inferred from the above passage?

(1) A higher proportion of deaf moths than hearing moths fall prey to bats.
(2) Deaf moths may try to avoid bats by frequent changes in their flight direction.
(3) Deaf moths are faster than hearing moths, and so are less prone to becoming a bat's dinner than hearing moths.
(4) The large wingspan enables deaf moths to better receive and sense the pulses of their bat predators.

116. Argentina's beef cattle herd has dropped to under 50 million from 57 million ten years ago in 1990. The animals are worth less, too: prices fell by over a third last year, before recovering slightly. Most local meat packers and processors are in financial trouble, and recent years have seen a string of plant closures. The Beef Producers' Association has now come up with a massive advertisement campaign calling upon Argentines to eat more beef - their "juicy, healthy, rotund, plate-filling" steaks.

Which one of the following, if true, would contribute most to a failure of the campaign?

(1) There has been a change in consumer preference towards eating leaner meats like chicken and fish.
(2) Prices of imported beef have been increasing, thus making locally grown beef more competitive in terms of pricing.
(3) The inability to cross breed native cattle with improved varieties has not increased production to adequate levels.
(4) Animal rights pressure groups have come up rapidly, demanding better and humane treatment of farmyard animals like beef cattle.

117. The problem of traffic congestion in Athens has been testing the ingenuity of politicians and town planners for years. But the measures adopted to date have not succeeded in decreasing the number of cars on the road in the city centre. In 1980, an odds and evens number-plate legislation was introduced, under which odd and even plates were banned in the city centre on alternate days, thereby expecting to halve the number of cars in the city centre. Then in 1993 it was decreed that all cars in use in the city centre must be fitted with catalytic converters; a regulation had just then been introduced, substantially reducing import taxes on cars with catalytic converters,

the only condition being that the buyer of such a 'clean' car offered for destruction a car at least 15 years old.

Which one of the following options, if true, would best support the claim that the measures adopted to date have not succeeded?

(1) In the 1980s, many families purchased second cars with the requisite odd or even number plate.
(2) In the mid-1990s, many families found it feasible to become first-time car owners by buying a car more than 15 years old and turning it in for a new car with catalytic converters.
(3) Post-1993, many families seized the opportunity to sell their more than 15 year-old cars and buy 'clean' cars from the open market, even if it meant forgoing the import tax subsidy.
(4) All of the above.

118. Although in the limited sense of freedom regarding appointments and internal working, the independence of the Central Bank is unequivocally ensured, the same cannot be said of its right to pursue monetary policy without coordination with the central government. The role of the Central Bank has turned out to be subordinate and advisory in nature.

Which one of the following best supports the conclusion drawn in the passage?

(1) A decision of the chairman of the Central Bank to increase the bank rate by two percentage points sent shock-waves in industry, academic and government circles alike.
(2) Government has repeatedly resorted to monetisation of the debt despite the reservation of the Central Bank.
(3) The Central Bank does not need the central government's nod for replacing soiled currency notes.
(4) The inability to remove coin shortage was a major shortcoming of this government.

119. The Shveta-chattra, the "White Umbrella," was a symbol of sovereign political authority placed over the monarch's head at the time of the coronation. The ruler so inaugurated was regarded not as a temporal autocrat but as the instrument of protective and sheltering firmament of supreme law. The white umbrella symbol is of great antiquity and its varied use illustrates the ultimate common basis of non-theocratic nature of states in the Indian tradition. As such, the umbrella is found, although not necessarily a white one, over the head of Lord Ram, the Mohammedan sultans and Chatrapati Shivaji.

Which one of the following best summarises the above passage?

(1) The placing of an umbrella over the ruler's head was a common practice in the Indian subcontinent.
(2) The white umbrella represented the instrument of firmament of the supreme law and the non-theocratic nature of Indian states.
(3) The umbrella, not necessarily a white one; was a symbol of sovereign political authority.
(4) The varied use of the umbrella symbolised the common basis of the non-theocratic nature of states in the Indian tradition.

120. The theory of games is suggested to some extent by parlour games such as chess and bridge. Friedman illustrates two distinct features of these games. First, in a parlour game played for money, if one wins the other (others) loses (lose). Second, these games are games involving a strategy. In a game of chess, while choosing what action is to be taken, a player tries to guess how his/her opponent will react to the various actions he or she might take. In contrast, the card-pastime, 'patience' or 'solitaire' is played only against chance.

Which one of the following can best be described as a "game?"

(1) The team of Tenzing Norgay and Edmund Hillary climbing Mt. Everest for the first time in human history.
(2) A national level essay writing competition.
(3) A decisive war between the armed forces of India and Pakistan over Kashmir.
(4) Oil Exporters' Union deciding on world oil prices, completely disregarding the countries which have at most minimal oil production.

121. Persons X, Y, Z and Q live in red, green, yellow or blue coloured houses placed in a sequence on a street. Z lives in a yellow house. The green house is adjacent to the blue house. X does not live adjacent to Z. The yellow house is in between the green and red houses. The colour of the house X lives in is

(1) blue
(2) green
(3) red
(4) not possible to determine

122. My bag can carry no more than ten books. I must carry at least one book each of management, mathematics, physics and fiction. Also, for every management book I carry I must carry two or more fiction books, and for every mathematics book I carry I must carry two or more physics books. I earn 4, 3, 2 and 1 points for each management, mathematics, physics and fiction book, respectively, I carry in my bag. I want to maximise the points I can earn by carrying the most appropriate combination of books in my bag. The maximum points that I can earn are

(1) 20 (2) 21
(3) 22 (4) 23

123. Five persons with names *P*, *M*, *U*, *T* and *X* live separately in any one of the following: a palace, a hut, a fort, a house or a hotel. Each one likes two different colours from among the following blue, black, red, yellow and green. *U* likes red and blue. *T* likes black. The person living in a palace does not like black or blue. *P* likes blue and red. *M* likes yellow. *X* lives in a hotel. *M* lives in a

(1) hut (2) palace
(3) fort (4) house

124. There are ten animals-two each of lion, panther, bison, bear, and deer in a zoo. The enclosures in the zoo are named X, Y, Z, P and Q and each enclosure is allotted to one of the following attendants Jack, Mohan, Shalini, Suman and Rita. Two animals of different species are housed in each enclosure. A lion and a deer cannot be together. A panther cannot be with either a deer or a bison. Suman attends to animals from among bison, deer, bear and panther only. Mohan attends to a lion and a panther. Jack does not attend to deer, lion or bison. X, Y and Z are allotted to Mohan, Jack and Rita respectively. X and Q enclosures have one animal of the same species. Z and P have the same pair of animals. The animals attended by Shalini are

(1) bear & bison (2) bison & deer
(3) bear & lion (4) bear & panther

125. Eighty kilograms (kg) of store material is to be transported to a location 10 km away. Any number of couriers can be used to transport the material can be packed in any number of units of 10, 20 or 40 kg. Courier charges are Rs. 10 per hour. Couriers travel at the speed of 10 km/hr if they are not carrying any load, at 5 km/hr if carrying 10 kg, at 2 km/hr if carrying 20 kg and at 1 km/hr if carrying 40 kg. A courier cannot carry more than 40 kg of load. The minimum cost at which 80 kg of store material can be transported will be

(1) Rs. 180 (2) Rs. 160
(3) Rs. 140 (4) Rs. 120

Instructions for questions 126 to 128*: Answer the following questions based on the information given below.*

Information Technology Industry in India (Figure are in million US dollars)

	1994-95	1995-96	1996-97	1997-98	1998-99
Software:					
Domestic	350	490	670	950	1250
Exports	485	734	1083	1750	2650
Hardware:					
Domestic	590	1037	1050	1205	1026
Exports	177	35	286	201	4
Peripherals:					
Domestic	148	196	181	229	329
Exports	6	6	14	19	18
Training	107	143	185	263	302
Maintenance	142	172	182	221	236
Networking and others	36	73	156	193	237
Total	2041	2886	3807	5031	6052

126. The total annual exports lay between 35 and 40 percent of the total annual business of the IT industry, in years

(1) 1997-98 and 1994-95
(2) 1996-97 and 1997-98
(3) 1996-97 and 1998-99
(4) 1996-97 and 1994-95

127. The highest percentage growth in the total IT business, relative to the previous year was achieved in

(1) 1995-96
(2) 1996-97
(3) 1997-98
(4) 1998-99

128. Which one of the following statements is correct?

(1) The annual software exports steadily increased but annual hardware exports steadily declined during 1994-1999.
(2) The annual peripheral exports steadily increased during 1994-1999.
(3) The total IT business in training during 1994-1999 was higher than the total IT business in maintenance during the same period.
(4) None of the above statements is true.

Instructions for questions 129 and 130*: Answer the following questions based on the information given below.*

For any activity, A, year X dominates year Y if IT business in activity A, in the year X, is greater than the IT business, in activity A, in the year Y. For any two IT business activities, A & B, year X dominates year Y if

i. The IT business in activity A, in the year X, is greater than or equal to the IT business, in activity A in the year Y,
ii. The IT business in activity B, in the year X, is greater than or equal to the IT business in activity B in the year Y and
iii. There should be strict inequality in the case of at least one activity.

129. For the IT hardware business activity, which one of the following is not true?

(1) 1997-98 dominates 1996-97
(2) 1997-98 dominates 1995-96
(3) 1995-96 dominates 1998-99
(4) 1998-99 dominates 1996-97

130. For the two IT business activities, hardware and peripherals, which one of the following is true?

(1) 1996-97 dominates 1995-96
(2) 1998-99 dominates 1995-96
(3) 1997-98 dominates 1998-99
(4) None of these

Directions for questions 131 to 140:

Choose 1 if the question can be answered by using one of the statements alone, but cannot be answered using the other statement alone.
Choose 2 if the question can be answered by using either statement alone.
Choose 3 if the question can be answered by using both statements together, but cannot be answered using either statement alone.
Choose 4 if the question cannot be answered even by using both statements together.

131. Consider three real numbers, X, Y and Z. Is Z the smallest of these numbers?

A. X is greater than at least one of Y and Z.
B. Y is greater than at least one of X and Z.

(1) 1 (2) 2
(3) 3 (4) 4

132. Let X be a real number. Is the modulus of X necessarily less than 3?

A. $X(X + 3) < 0$
B. $X(X - 3) > 0$

(1) 1 (2) 2
(3) 3 (4) 4

133. How many people are watching TV programme P?

A. Number of people watching TV programme Q is 1000 and number of people watching both the programmes, P and Q, is 100.
B. Number of people watching either P or Q or both is 1500.

(1) 1 (2) 2
(3) 3 (4) 4

134. Triangle PQR has angle PRQ equal to 90 degrees. What is the value of PR + RQ?

A. Diameter of the inscribed circle of the triangle PQR is equal to 10 cm.
B. Diameter of the circumscribed circle of the triangle PQR is equal to 18 cm.

(1) 1 (2) 2
(3) 3 (4) 4

135. Harshad bought shares of a company on a certain day, and sold them the next day. While buying and selling he had to pay to the broker one percent of the transaction value of the shares as brokerage. What was the profit earned by him per rupee spent on buying the shares?

A. The sales price per share was 1.05 times that of its purchase price.
B. The number of shares purchased was 100.

(1) 1 (2) 2
(3) 3 (4) 4

136. For any two real numbers

$a \oplus b = 1$ if both a and b are positive or both a and b are negative.

$= -1$ if one of the two numbers a and b is positive and the other negative.

What is $(2 \oplus 0) \oplus (-5 \oplus -6)$?

A. $a \oplus b$ is zero if a is zero.
B. $a \oplus b = b \oplus a$

(1) 1 (2) 2
(3) 3 (4) 4

137. There are two straight lines in the x-y plane with equations $ax + by = c$, $dx + ey = f$. Do the two straight lines intersect?

A. a, b, c, d, e and f are distinct real numbers.
B. c and f are non-zero.

(1) 1 (2) 2
(3) 3 (4) 4

138. O is the centre of two concentric circles. ae is a chord of the outer circle and it intersects the inner circle at point; b and d. c is a point on the chord in between b and d. What is the value of ac/ce?

A. $bc/cd = 1$
B. A third circle intersects the inner circle at b and d and the point c is on the line joining the centres of the third circle and the inner circle.

(1) 1 (2) 2
(3) 3 (4) 4

139. Ghosh Babu has decided to take a non-stop flight from Mumbai to No-man's-land in South America. He is scheduled to leave Mumbai at 5 am, Indian Standard Time on December 10, 2000. What is the local time at No-man's-land when he reaches there?

A. The average speed of the plane is 700 kilometres per hour.
B. The flight distance is 10,500 kilometres.

(1) 1 (2) 2
(3) 3 (4) 4

140. What are the ages of two individuals, X and Y?

A. The age difference between them is 6 years.
B. The product of their ages is divisible by 6.

(1) 1 (2) 2
(3) 3 (4) 4

Instructions for questions 141 to 145*: Answer the following questions based on the information given below.*

Factory Sector by Type of Ownership.
All figures in the table are in percent of the total for the corresponding column.

Sector	Factories	Employment	Fixed Capital	Gross Output	Value Added
Public	7	27.7	43.2	25.8	30.8
Central Govt.	1	10.5	17.5	12.7	14.1
State/local Govt.	5.2	16.2	24.3	11.6	14.9
Central & State/local Govt.	0.8	1	1.4	1.5	1.8
Joint	1.8	5.1	6.8	8.4	8.1
Wholly private	90.3	64.6	46.8	63.8	58.7
Others	0.9	2.6	3.2	2	2.4
Total	100	100	100	100	100

141. Suppose the average employment level is 60 per factory. The average employment in "wholly private" factories is approximately

(1) 43 (2) 47 (3) 50 (4) 54

142. Among the firms in different sectors, value added per employee is highest in

(1) Central government (2) Central and State/local governments
(3) Joint sector (4) Wholly private

143. Capital productivity is defined as the gross output value per rupee of fixed capital. The three sectors with the higher capital productivity, arranged in descending order are

(1) Joint, wholly private, central and state/local
(2) Wholly private, joint, central and state/local
(3) Wholly private, central and state/local, joint
(4) Joint, wholly private, central

144. A sector is considered "pareto efficient" if its value added per employee and its value added per rupee of fixed capital is higher than those of all other sectors. Based on the table data, the pareto efficient sector is

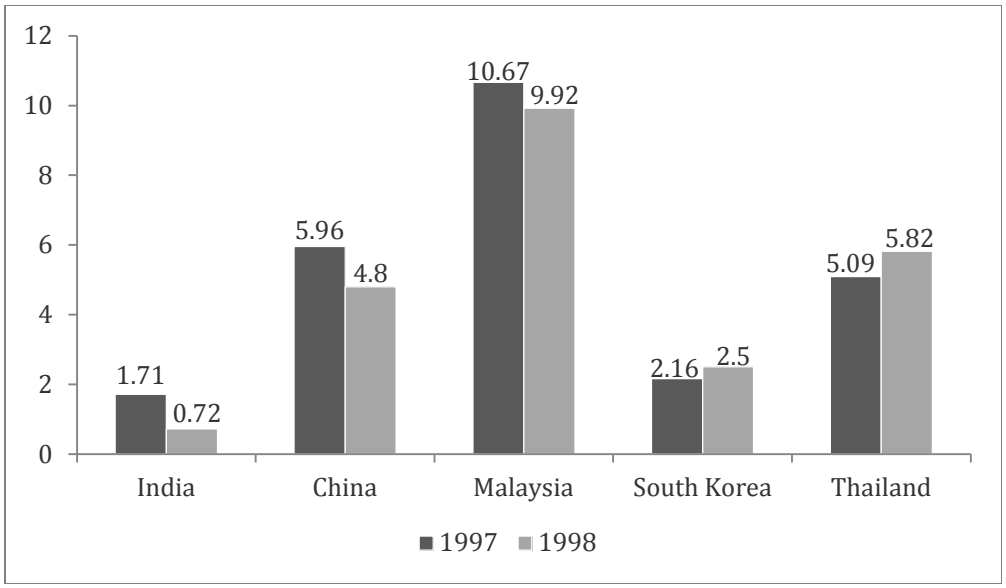
(1) Wholly private (2) Joint
(3) Central and state/local (4) Others

145. The total value added in all sectors is estimated at Rs. 140,000 crores. Suppose that the number of firms in the joint sector is 2700. The average value added per factory, in Rs. crores, in the central government is

(1) 141 (2) 14.1 (3) 131 (4) 13.1

Instructions for questions 146 to 149*: Answer the following questions based on the information given below.*

FEI for a country in a year, is the ratio (expressed as a percentage) of its foreign equity inflows to its GDP. The following figure displays the FEIs for select Asian countries for the years 1997 and 1998.



146. The country with the largest change in FEI in 1998 relative to its FEI in 1997, is

(1) India (2) China (3) Malaysia (4) Thailand

147. Based on the data provided, it can be concluded that

(1) absolute value of foreign equity inflows in 1998 was higher than that in 1997 for both Thailand and South Korea.
(2) absolute value of foreign equity inflows was higher in 1998 for Thailand and lower for China than the corresponding values in 1997.
(3) absolute value of foreign equity inflows was lower in 1998 for both India and China than the corresponding value in 1997.
(4) none of the above can be inferred.

148. It is known that China's GDP in 1998 was 7% higher than its value in 1997, while India's GDP grew by 2% during the same period. The GDP of South Korea, on the other hand, fell by 5%. Which of the following statements is/are true?

I. Foreign equity inflows to China were higher in 1998 than in 1997.
II. Foreign equity inflows to China were lower in 1998 than in 1997.
III. Foreign equity inflows to India were higher in 1998 than in 1997.
IV. Foreign equity inflows to South Korea decreased in 1998 relative to 1997.
V. Foreign equity inflows to South Korea increased in 1998 relative to 1997.

(1) I, III & IV (2) II, III & IV
(3) I, III & V (4) II & V

149. China's foreign equity inflows in 1998 were 10 times that into India. It can be concluded that

(1) China's GDP in 1998 was 40% higher than that of India.
(2) China's GDP in 1998 was 70% higher than that of India.
(3) China's GDP in 1998 was 50% higher than that of India.
(4) No inference can be drawn about relative magnitudes of China's and India's GDPs.

Instructions for questions 150 to 153: *Answer the following questions based on the information given below.*

The table shows trends in external transactions of Indian corporate sector during the period 1993-94 to 1997-98. In addition, following definitions hold good.
$Sales_i$, $Imports_i$, and $Exports_i$ respectively denote the sales, imports and exports in year *i*.
Deficit in year *i*, $Deficit_i = Imports_i - Exports_i$.
Deficit Intensity in year *i*, $DI_i = Deficit_i / Sales_i$.
Growth rate of deficit intensity in year *i*, $GDI_i = (DI_i - DI_{i-1})/DI_{i-1}$
Further, note that all imports are classified as either raw material or capital goods.
Trends in External Transactions of Indian Corporate Sector (All figures in %)

Year	1997-98	1996-97	1995-96	1994-95	1993-94
Export Intensity*	9.2	8.2	7.9	7.5	7.3
Import Intensity*	14.2	16.2	15.5	13.8	12.4
Imported raw material/ Total cost of raw material	20.2	19.2	17.6	16.3	16
Imported capital goods/ Gross fixed assets	17.6	9.8	11.8	16.3	19.5

* Ratio of Exports (or Imports) to sales.

150. The highest growth rate in deficit intensity was recorded in

(1) 1994-95 (2) 1995-96 (3) 1996-97 (4) 1997-98

151. The value of the highest growth rate in deficit intensity is approximately

(1) 8.45% (2) 2.15% (3) 33.3% (4) 23.5%

152. In 1997-98 the total cost of raw materials is estimated as 50% of sales of that year. The turnover of Gross fixed assets, defined as the ratio of sales to Gross fixed assets, in 1997-98 is, approximately

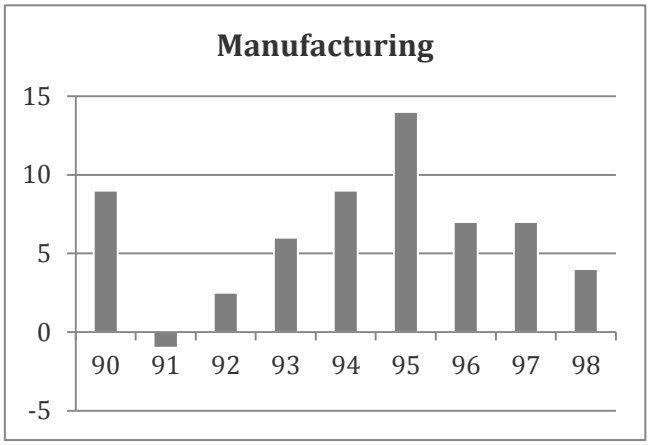
(1) 3.3 (2) 4.3
(3) 0.33 (4) not possible to determine

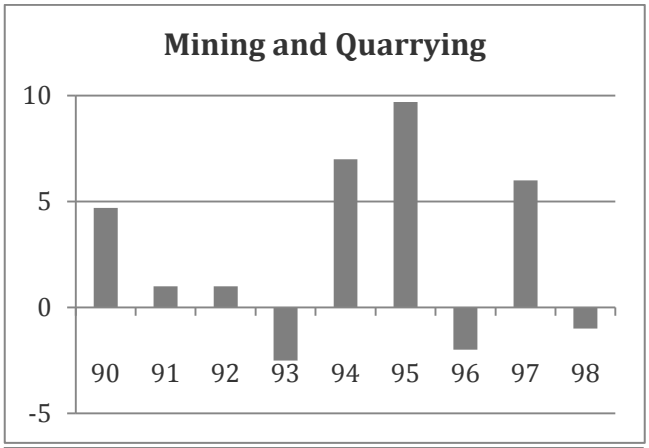
153. Which of the following statements can be inferred to be true from the given data?

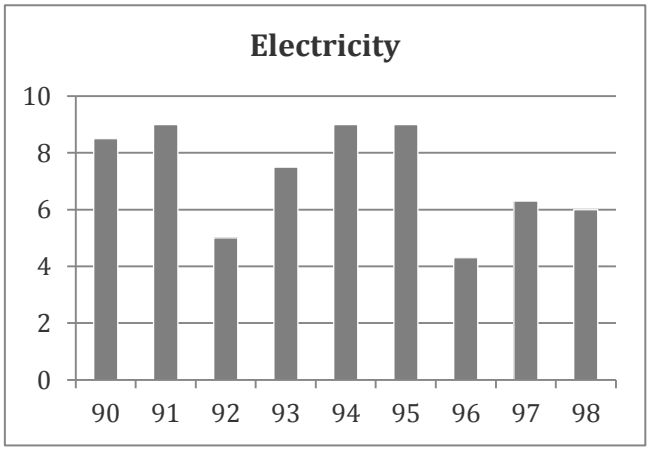
(1) During the 5 year period between 1993-94 and 1997-98, exports have increased every year.
(2) During the 5 year period between 1993-94 and 1997-98, imports have decreased every year.
(3) Deficit in 1997-98 was lower than that in 1993-94.
(4) Deficit intensity has increased every year between 1993-94 and 1996-97.

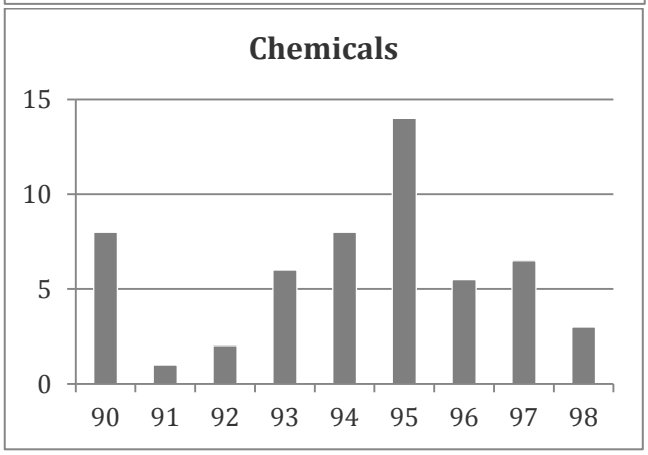
Instructions for questions 154 to 159: *Answer the following questions based on the information given below.*

The figures below present annual growth rate, expressed as the % change relative to the previous year, in four sectors of the economy of the Republic of Reposia during the 9 year period from 1990 to 1998. Assume that the index of production for each of the four sectors is set at 100 in 1989. Further, the four sectors manufacturing, mining and quarrying, electricity, and chemicals, respectively, constituted 20%, 15%, 10% and 15% of total industrial production in 1989.









154. Which is the sector with the highest growth during the period 1989 and 1998?

(1) Manufacturing (2) Mining and quarrying
(3) Electricity (4) Chemicals

155. The overall growth rate in 1991 of the four sectors together is approximately

(1) 10% (2) 1% (3) 2.5% (4) 1.5%

156. When was the highest level of production in the manufacturing sector achieved during the nine year period 1990-1998?

(1) 1998 (2) 1995 (3) 1990 (4) Cannot be determined

157. When was the lowest level of production of the mining and quarrying sector achieved during the nine year period 1990-1998?

(1) 1996 (2) 1993 (3) 1990 (4) Cannot be determined

158. The percentage increase of production in the four sectors, namely, manufacturing, mining & quarrying, electricity and chemicals, taken together, in 1994, relative to 1989, is approximately

(1) 25 (2) 20 (3) 50 (4) 40

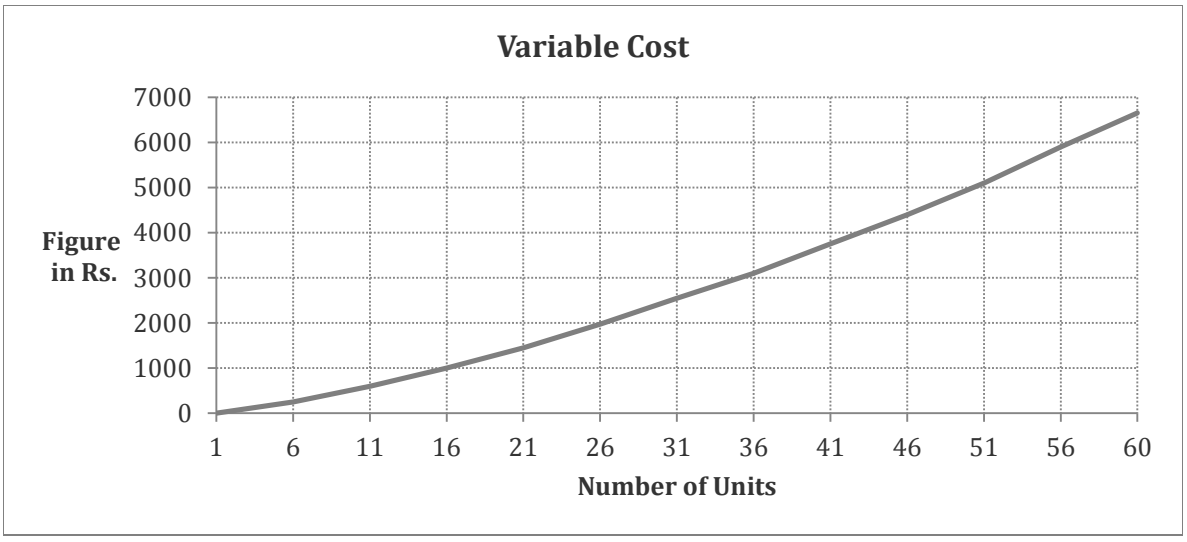
159. It is known that the index of total industrial production in 1994 was 50 percent more than that in 1989. Then, the percentage increase in production between 1989 and 1994 in sectors other than the four listed above is

(1) 57.5 (2) 87.5 (3) 127.5 (4) 47.5

Instructions for questions 160 to 165: *Answer the following questions based on the information given below.*

ABC Ltd. produces widgets for which the demand is unlimited and they can sell all of their production. The graph below describes the monthly variable costs incurred by the company as a function of the quantity produced. In addition, operating the plant for one shift results in a fixed monthly cost of Rs. 800. Fixed monthly costs for second shift operation are estimated at Rs. 1200. Each shift operation provides capacity for producing 30 widgets per month.

Note : Average unit cost, AC = Total monthly costs/monthly production, and
Marginal cost, MC is the rate of change in total cost for unit change in quantity produced.



160. Total production in July is 40 units. What is the approximate average unit cost for July?

(1) 3600 (2) 90 (3) 140 (4) 115

161. ABC Ltd. is considering increasing the production level. What is the approximate marginal cost of increasing production from its July level of 40 units?

(1) 110 (2) 130 (3) 240 (4) 160

162. From the data provided it can be inferred that, for production levels in the range of 0 to 60 units.

(1) MC is an increasing function of production quantity.
(2) MC is a decreasing function of production quantity.
(3) Initially MC is a decreasing function of production quantity, attains a minimum and then it is an increasing function of production quantity.
(4) None of the above.

163. Suppose that each widget sells for Rs 150. What is the profit earned by ABC Ltd. in July? (Profit is defined as the excess of sales revenue over total cost.)

(1) 2400 (2) 1600 (3) 400 (4) 0

164. Assume that the unit price is Rs. 150 and profit is defined as the excess of sales revenue over total costs. What is the monthly production level of ABC Ltd. at which the profit is highest?

(1) 30 (2) 50 (3) 60 (4) 40

165. For monthly production level in the range of 0 to 30 units

(1) AC is always higher than MC.
(2) AC is always lower than MC.
(3) AC is lower than MC up to a certain level and then is higher than MC.
(4) None of the above is true.

Answer Key

SECTION I			
Q.	**Ans.**	**Q.**	**Ans.**
1	**2**	31	**1**
2	**1**	32	**2**
3	**3**	33	**3**
4	**4**	34	**1**
5	**1**	35	**4**
6	**3**	36	**3**
7	**4**	37	**1**
8	**2**	38	**2**
9	**3**	39	**4**
10	**2**	40	**2**
11	**4**	41	**2**
12	**2**	42	**4**
13	**1**	43	**1**
14	**3**	44	**3**
15	**1**	45	**3**
16	**4**	46	**2**
17	**2**	47	**4**
18	**3**	48	**1**
19	**1**	49	**3**
20	**3**	50	**4**
21	**4**	51	**1**
22	**4**	52	**3**
23	**2**	53	**1**
24	**1**	54	**2**
25	**3**	55	**4**
26	**2**		
27	**3**		
28	**4**		
29	**1**		
30	**4**		

SECTION II			
Q.	**Ans.**	**Q.**	**Ans.**
56	**3**	86	**3**
57	**2**	87	**3**
58	**4**	88	**2**
59	**3**	89	**3**
60	**3**	90	**2**
61	**2**	91	**1**
62	**2**	92	**3**
63	**1**	93	**3**
64	**4**	94	**4**
65	**4**	95	**2**
66	**1**	96	**1**
67	**3**	97	**1**
68	**3**	98	**4**
69	**4**	99	**2**
70	**1**	100	**2**
71	**2**	101	**1**
72	**3**	102	**4**
73	**1**	103	**2**
74	**4**	104	**1**
75	**4**	105	**2**
76	**1**	106	**1**
77	**4**	107	**2**
78	**1**	108	**3**
79	**2**	109	**4**
80	**1**	110	**4**
81	**1**		
82	**3**		
83	**4**		
84	**2**		
85	**2**		

SECTION III			
Q.	**Ans.**	**Q.**	**Ans.**
111	**3**	141	**1**
112	**2**	142	**2**
113	**4**	143	**2**
114	**3**	144	**3**
115	**2**	145	**4**
116	**1**	146	**1**
117	**4**	147	**4**
118	**2**	148	**4**
119	**4**	149	**3**
120	**3**	150	**1**
121	**1**	151	**4**
122	**3**	152	**2**
123	**2**	153	**4**
124	**3**	154	**3**
125	**2**	155	**2**
126	**2**	156	**1**
127	**1**	157	**2**
128	**3**	158	**1**
129	**4**	159	**2**
130	**4**	160	**3**
131	**3**	161	**2**
132	**1**	162	**4**
133	**3**	163	**3**
134	**3**	164	**1**
135	**1**	165	**4**
136	**3**		
137	**4**		
138	**2**		
139	**4**		
140	**4**		

2

PREVIOUS CAT QUESTION PAPER

CAT 2001

Before the Test:

1. DO NOT REMOVE THE SEAL OF THIS BOOKLET UNTIL THE SIGNAL TO START IS GIVEN.
2. Keep only a pencil, eraser and sharpener with you. DO NOT KEEP with you books, rulers, slide rules, drawing instruments, calculators (including watch calculators), pagers, cellular phones, stop watches or any other device or loose paper. These should be left at a place indicated by the invigilator.
3. Use only HB pencil to fill in the Answer Sheet.
4. Enter in your Answer Sheet: (a) in Box 3, the Test Form Number that appears at the bottom of this page, (b) in Box 4, the Test Booklet Serial Number that appears at the top of this page.
5. Ensure that your personal data have been entered correctly on Side - II of the Answer Sheet.
6. Ensure that you have entered your 8-digit Test Registration Number in Box 2 of the Answer Sheet correctly. Start entering the number from the leftmost cell, leaving the last three cells blank.

At the start of the Test:

1. As soon as the signal to start is given, open the Test Booklet.
2. This Test Booklet contains 32 pages, including the blank ones. Immediately after opening the Test Booklet, verify that all the pages are printed properly and are in order. If there is a problem with your Test Booklet, immediately inform the invigilator. You will be provided with a replacement.

How to answer:

This test contains 150 questions in three sections. **There are 50 questions in Section I, 50 questions in Section II and 50 questions in Section III**. You have two hours to complete the test. In distributing the time over the three sections, please bear in mind that you need to demonstrate your competence in all three sections.

1. Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles on the Answer Sheet. Each question has only one correct answer.
2. **All questions carry 1 mark each. For a wrong answer you will lose one-third of the marks allotted to the question.**
3. Do your rough work only on the Test Booklet and NOT on the Answer Sheet.
4. Follow the instructions of the invigilator. Students found violating the instructions will be disqualified.

After the Test:

1. At the end of the test, remain seated. The invigilator will collect the Answer Sheet from your seat. Do not leave the hall until the invigilator announces "You may leave now". The invigilator will make this announcement only after collecting the Answer Sheets from all the students in the room.
2. You may retain this Test Booklet with you.

Test Form Number: 111

Section I

1. A student took five papers in an examination, where the full marks were the same for each paper. His marks in these papers were in the proportion of 6 : 7 : 8 : 9 : 10. In all papers together, the candidate obtained 60% of the total marks. Then the number of papers in which he got more than 50% marks is

(1) 2 (2) 3
(3) 4 (4) 5

2. A square, whose side is 2 metres, has its corners cut away so as to form an octagon with all sides equal. Then the length of each side of the octagon, in metres is

(1) $\frac{\sqrt{2}}{\sqrt{2}+1}$ (2) $\frac{2}{\sqrt{2}+1}$

(3) $\frac{2}{\sqrt{2}-1}$ (4) $\frac{\sqrt{2}}{\sqrt{2}-1}$

3. Let x, y and z be distinct integers. x and y are odd and positive, and z is even and positive. Which one of the following statements cannot be true?

(1) $(x - z)^2y$ is even
(2) $(x - z)^2y$ is odd
(3) $(x - y)y$ is odd
(4) $(x - y)^2z$ is even

4. If $x > 5$ and $y < -1$, then which of the following statements is true?

(1) $(x + 4y) > 1$
(2) $x > -4y$
(3) $-4x < 5y$
(4) None of these

5. A red light flashes 3 times per minute and a green light flashes 5 times in two minutes at regular intervals. If both lights start flashing at the same time, how many times do they flash together in each hour?

(1) 30 (2) 24
(3) 20 (4) 60

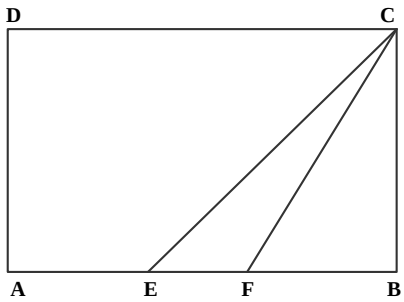
6. Of 128 boxes of oranges, each box contains at least 120 and at most 144 oranges. The number of boxes containing the same number of oranges is at least

(1) 5 (2) 103
(3) 6 (4) Cannot be determined

7. A certain city has a circular wall around it, and this wall has four gates pointing north, south, east and west. A house stands outside the city, three km north of the north gate, and it can just be seen from a point nine km east of the south gate. What is the diameter of the wall what surrounds the city?

(1) 6 km (2) 9 km
(3) 12 km (4) None of these

8.



In the above diagram, ABCD is a rectangle with AE = EF = FB. What is the ratio of the area of the triangle CEF and that of the rectangle?

(1) $\frac{1}{6}$ (2) $\frac{1}{8}$

(3) $\frac{1}{9}$ (4) None of these

9. A can complete a piece of work in 4 days. B takes double the time taken by A, C takes double that of B, and D takes double that of C to complete the same task. They are paired in groups of two each. One pair takes two thirds the time needed by the second pair to complete the work. Which is the first pair?

(1) A, B (2) A, C
(3) B, C (4) A, D

10. In a 4-digit number, the sum of the first two digits is equal to that of the last two digits. The sum of the first and last digits is equal to the third digit. Finally, the sum of the second and fourth digits is twice the sum of the other two digits. What is the third digit of the number?

(1) 5 (2) 8
(3) 1 (4) 4

11. Two men X and Y started working for a certain company at similar jobs on January 1, 1950. X asked for an initial salary of Rs. 300 with an annual increment of Rs. 30. Y asked for an initial salary of Rs. 200 with a rise of Rs. 15 every six months. Assume that the arrangements remained unaltered till December, 1959. Salary is paid on the last day of the month. What is the total amount paid to them as salary during the period?

(1) Rs. 93,300 (2) Rs. 93,200
(3) Rs. 93,100 (4) None of these

12. Anita had to do a multiplication. Instead of taking 35 as one of the multipliers, she took 53. As a result, the product went up by 540. What is the new product?

(1) 1050 (2) 540
(3) 1440 (4) 1590

13. A college has raised 75% of the amount it needs for a new building by receiving an average donation of Rs. 600 from the people already solicited. The people already solicited represent 60% of the people the college will ask for donations. If the college is to raise exactly the amount needed for the new building, what should be the average donation from the remaining people to be solicited?

(1) Rs 300 (2) Rs 250
(3) Rs 400 (4) Rs 500

14. x and y are real numbers satisfying the conditions $2 < x < 3$ and $-8 < y < -7$. Which of the following expressions will have the least value?

(1) x^2y (2) xy^2
(3) $5xy$ (4) None of these

15. m is the smallest positive integer such that for any integer $n > m$, the quantity $n^3 - 7n^2 + 11n - 5$ is positive. What is the value of m?

(1) 4 (2) 5
(3) 8 (4) None of these

16. A ladder leans against a vertical wall. The top of the ladder is 8 m above the ground. When the bottom of the ladder is moved 2 m farther away from the wall, the top of the ladder rests against the foot of the wall. What is the length of the ladder?

(1) 10 m (2) 15 m
(3) 20 m (4) 17 m

17. Three friends, returning from a movie, stopped to eat at a restaurant. After dinner, they paid their bill and noticed a bowl of mints at the front counter. Sita took 1/3 of the mints, but returned four because she had a momentary pang of guilt. Fatima then took 1/4 of what was left but returned three for similar reasons. Eswari then took half of the remainder but threw two back into the bowl. The bowl had only 17 mints left when the raid was over. How many mints were originally in the bowl?

(1) 38 (2) 31
(3) 41 (4) None of these

18. If 09/12/2001 happens to be Sunday, then 09/12/1971 would have been a

(1) Wednesday (2) Tuesday
(3) Saturday (4) Thursday

19. In a number system the product of 44 and 11 is 1034. The number 3111 of this system, when converted to the decimal number system, becomes

(1) 406 (2) 1086
(3) 213 (4) 691

20. At his usual rowing rate, Rahul can travel 12 miles downstream in a certain river in six hours less than it takes him to travel the same distance upstream. But if he could double his usual rowing

rate for this 24 miles round trip, the downstream 12 miles would then take only one hour less than the upstream 12 miles. What is the speed of the current in miles per hour?

(1) $\frac{7}{3}$ (2) $\frac{4}{3}$

(3) $\frac{5}{3}$ (4) $\frac{8}{3}$

21. Every ten years the Indian government counts all the people living in the country. Suppose that the director of the census has reported the following data on two neighbouring villages Chota hazri and Mota hazri:
Chota hazri has 4,522 fewer males than Mota hazri.
Mota hazri has 4,020 more females than males.
Chota hazri has twice as many females as males.
Chota hazri has 2,910 fewer females than Mota hazri.
What is the total number of males in Chota hazri?

(1) 11264 (2) 14174
(3) 5632 (4) 10154

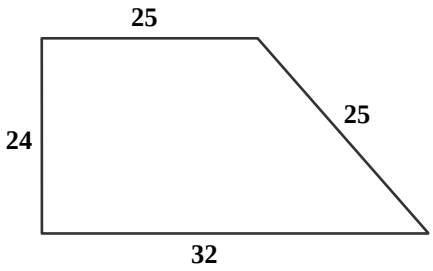
22. Three math classes; X, Y, and Z, take an algebra test.
The average score in class X is 83.
The average score in class Y is 76.
The average score in class Z is 85.

The average score of all students in classes X and Y together is 79.

The average score of all students in classes Y and Z together is 81.
What is the average for all three classes?

(1) 81 (2) 81.5
(3) 82 (4) 84.5

23. Two sides of a plot measure 32 metres and 24 metres and the angle between them is a perfect right angle. The other two sides measure 25 metres each and the other three are not right angles.



What is the area of the plot?

(1) 768 (2) 534
(3) 696.5 (4) 684

24. All the page numbers from a book are added, beginning at page 1. However, one page number was mistakenly added twice. The sum obtained was 1000. Which page number was added twice?

(1) 44 (2) 45
(3) 10 (4) 12

25. Shyama and Vyom walk up an escalator (moving stairway). The escalator moves at a constant speed. Shyama takes three steps for every two of Vyom's steps. Shyama gets to the top of the escalator after having taken 25 steps. While Vyom (because his slower pace lets the escalator do a little more of the work) takes only 20 steps to reach the top. If the escalator were turned off, how many steps would they have to take to walk up?

(1) 40 (2) 50
(3) 60 (4) 80

26. At a certain fast food restaurant, Brian can buy 3 burgers, 7 shakes, and one order of fries for Rs. 120 exactly. At the same place it would cost Rs. 164.5 for 4 burgers, 10 shakes, and one order of fries. How much would it cost for an ordinary meal of one burger, one shake, and one order of fries?

(1) Rs. 31 (2) Rs. 41
(3) Rs. 21 (4) Cannot be determined

27. If a, b, c and d are four positive real numbers such that $abcd = 1$, what is the minimum value of $(1 + a)(1 + b)(1 + c)(1 + d)$?

(1) 4 (2) 1
(3) 16 (4) 18

28. There's a lot of work in preparing a birthday dinner. Even after the turkey is in oven, there are still the potatoes and gravy, yams, salad, and cranberries, not to mention setting the table. Three friends, Asit, Arnold, and Afzal, work together to get all of these chores done. The time it takes them to do the work together is six hours less than Asit would have taken working alone, one hour less than Arnold would have taken, and half the time Afzal would have taken working alone.
How long did it take them to do these chores working together?

(1) 20 minutes (2) 30 minutes
(3) 40 minutes (4) 50 minutes

29. Euclid has a triangle in mind, Its longest side has length 20 and another of its sides has length 10. Its area is 80. What is the exact length of its third side?

(1) $\sqrt{260}$ (2) $\sqrt{250}$
(3) $\sqrt{240}$ (4) $\sqrt{270}$

30. For a Fibonacci sequence, from the third term onwards, each term in the sequence is the sum of the previous two terms in that sequence. If the difference in squares of seventh and sixth terms of this sequence is 517, what is the tenth term of this sequence?

(1) 147
(2) 76
(3) 123
(4) Cannot be determined

31. Fresh grapes contain 90% water by weight while dry grapes contain 20% water by weight. What is the weight of dry grapes available from 20 kg of fresh grapes?

(1) 2 kg (2) 2.4 kg
(3) 2.5 kg (4) None of these

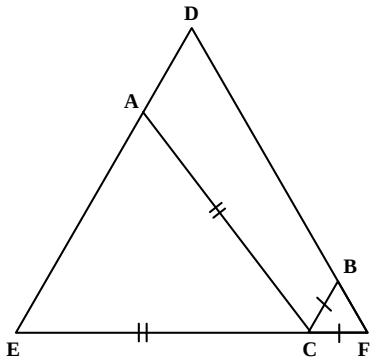
32. A train X departs from station A at 11.00 a.m. for station B, which is 180 km away. Another train Y departs from station B at 11.00 a.m. for station A. Train X travels at an average speed of 70 km/hr and does not stop anywhere until it arrives at station B. Train Y travels at an average speed of 50 km/hr, but has to stop for 15 minutes at station C, which is 60 km away from station B enroute to station A. Ignoring the lengths of the trains, what is the distance, to the nearest km, from station A to point where the trains cross other?

(1) 112 (2) 118
(3) 120 (4) None of these

33. A set of consecutive positive integers beginning with 1 is written on the blackboard. A student came along and erased one number. The average of the remaining numbers is $35\frac{7}{17}$. What was the number erased?

(1) 7 (2) 8
(3) 9 (4) None of these

34. In ΔDEF shown below, points A, B, and C are taken on DE, DF and EF respectively such that EC = AC and CF = BC. If ∠D = 40°, then what is ∠ACB in degrees?



(1) 140 (2) 70
(3) 100 (4) None of these

35. The owner of an art shop conducts his business in the following manner: Every once in a while he raises his prices by *X*%, then a while later he reduces all the new prices by *X*%. After one such up-down cycle, the price of a painting decreased by Rs. 441. After a second up-down cycle the painting was sold for Rs. 1,944.81. What was the original price of the painting?

(1) Rs 2,756.25 (2) Rs 2,256.25
(3) Rs 2,500 (4) Rs 2,000

36. Three runners A, B and C run a race, with runner A finishing 12 metres ahead of runner B and 18 metres ahead of runner C, while runner B finishes 8 metres ahead of runner C. Each runner travels the entire distance at a constant speed. What was the length of the race?

(1) 36 meters (2) 48 meters
(3) 60 meters (4) 72 meters

37. Let x, y be two positive numbers such that $x + y = 1$. Then, the minimum value of

$(x + \frac{1}{x})^2 + (y + \frac{1}{y})^2$ is _____

(1) 12 (2) 20
(3) 12.5 (4) 13.3

Instructions for questions 38 – 39:

The batting average (BA) of a test batsman is computed from runs scored and innings played-completed innings and incomplete innings (not out) in the following manner:
r_1 = number of runs scored in completed innings;
n_1 = number of completed innings
r_2 = number of runs scored in incomplete innings;
n_2 = number of incomplete innings

$$\text{BA} = \frac{r_1 + r_2}{n_1}$$

To better assess batsman's accomplishments, the ICC is considering two other measures MBA_1 and MBA_2 defined as follows:

$$\text{MBA}_1 = \frac{r_1}{n_1} + \frac{n_2}{n_1} \max\left[0, \left(\frac{r_2}{n_2} - \frac{r_1}{n_1}\right)\right]$$

$$\text{MBA}_2 = \frac{r_1 + r_2}{n_1 + n_2}$$

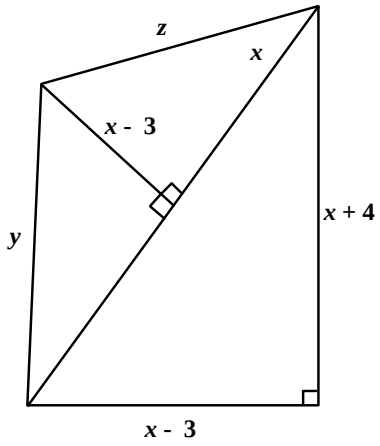
38. Based on the information provided which of the following is true?

(1) $\text{MBA}_1 \le \text{BA} \le \text{MBA}_2$
(2) $\text{BA} \le \text{MBA}_2 \le \text{MBA}_1$
(3) $\text{MBA}_2 \le \text{BA} \le \text{MBA}_1$
(4) None of these

39. An experienced cricketer with no incomplete innings has a BA of 50. The next time he bats, the innings is incomplete and he scores 45 runs. It can be inferred that:

(1) BA and MBA_1 will both increase
(2) BA will increase and MBA_2 will decrease
(3) BA will increase and not enough data is available to assess change in MBA_1 and MBA_2
(4) None of these

40. Based on the figure below, what is the value of x, if $y = 10$?



(1) 0 (2) 11
(3) 12 (4) None of these

41. A rectangular pool 20 metres wide and 60 metres long is surrounded by a walkway of uniform width. If the total area of the walkway is 516 square metres, how wide, in metres, is the walkway?

(1) 43 (2) 4.3
(3) 3 (4) 3.5

42. Let b be a positive integer and $a = b^2 - b$. If $b \ge 4$, then $a^2 - 2a$ is divisible by

(1) 15 (2) 20
(3) 24 (4) None of these

43. Ashish is given Rs. 158 in one rupee denominations. He has been asked to allocate them into a number of bags such that any amount required between Re. 1 and Rs. 158 can be given by handing out a certain number of bags without opening them. What is the minimum number of bags required?

(1) 11 (2) 12
(3) 13 (4) None of these

44. In some code, letters, *a, b, c, d* and *e* represent numbers 2, 4, 5, 6 and 10. However, we don't know which letter represent which number. Consider the following relationships:

i. $a + c = e$
ii. $b - d = d$
iii. $e + a = b$

(1) $b = 4, d = 2$ (2) $a = 4, e = 6$
(3) $b = 6, e = 2$ (4) $a = 4, c = 6$

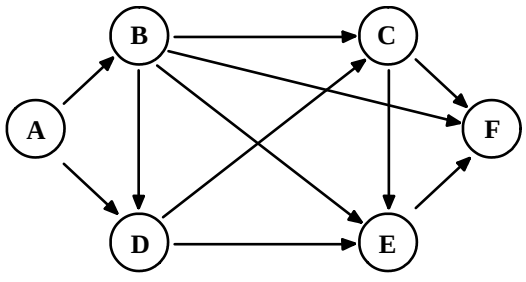
45. Ujakar and Keshab attempted to solve a quadratic equation. Ujakar made a mistake in writing down the constant term. He ended up with the roots (4, 3). Keshab made a mistake in writing down the coefficient of *x*. He got the root as (3, 2). What will be the exact roots of the original quadratic equation?

(1) (6, 1) (2) (–3, –4)
(3) (4, 3) (4) (–4, –3)

46. A change making machine contains 1 rupee, 2 rupee and 5 rupee coins. The total number of coins is 300. The amount is Rs. 960. If the number of 1 rupee coins and the number of 2 rupee coins are interchanged, the value comes down by Rs. 40. The total number of 5 rupee coins is

(1) 100 (2) 140
(3) 60 (4) 150

47. The figure below shows the network connecting cities A, B, C, D, E and F. The arrows indicate permissible direction of travel. What is the number of distinct paths from A to F?



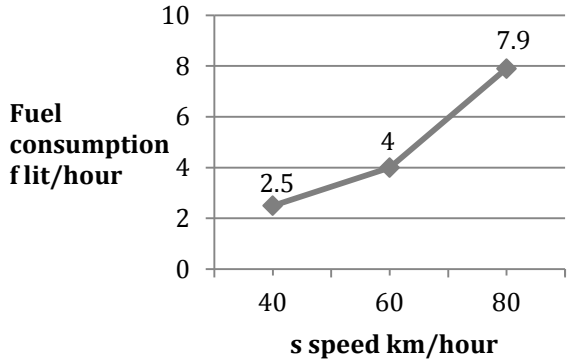
(1) 9 (2) 10
(3) 11 (4) None of these

48. Let *n* be the number of different 5 digit numbers, divisible by 4 with the digits 1, 2, 3, 4, 5 and 6, no digit being repeated in the numbers. What is the value of *n*?

(1) 144 (2) 168
(3)192 (4) None of these

Instructions for questions 49 – 50:
Answer the following questions based on the information given below

The petrol consumption rate of a new model car 'Palto' depends on its speed and may be described by the graph below.



49. Manasa makes the 200 km trip from Mumbai to Pune at a steady speed of 60 km/hour. What is the amount of petrol consumed for the journey?

(1) 12.5 litres (2) 13.33 litres
(3) 16 litres (4) 19.75 litres

50. Manasa would like to minimize the fuel consumption for the trip by driving at the appropriate speed. How should she change the speed?

(1) Increase the speed
(2) Decrease the speed
(3) Maintain the speed at 60 km/hour
(4) Cannot be determined

Section II

Instruction for questions 51 - 55:
For the word given at the top of each table, match the dictionary definitions on the left (A, B, C, D) with their corresponding usage on the right (E, F, G, H). Out of the four possibilities given in the boxes below the table, select the one that has all the definitions and their usages correctly matched.

51. EXCEED

	Dictionary Definition		Usage
A.	To extend outside of or enlarge beyond-used chiefly in strictly physical phenomena.	E.	The mercy of God exceeds our finite minds.
B.	To be greater than or superior to	F.	Their accomplishments exceeded our expectation.
C.	Be beyond the comprehension of	G.	He exceeded his authority when he paid his brother's gambling debts with money from the trust.
D.	To go beyond a limit set by (as an authority or privilege)	H.	If this rain keeps up, the river will exceed its banks by morning.

(1) A-H, B-F, C-E, D-G
(2) A-H, B-E, C-F, D-G
(3) A-G, B-F, C-E, D-H
(4) A-F, B-G, C-H, D-E

52. INFER

	Dictionary Definition		Usage
A.	To derive by reasoning or implication	E.	We see smoke and infer fire.
B.	To surmise	F.	Given some utterance, a listener may infer from it all sorts of things which neither the utterance nor the utterer implied.
C.	To point out	G.	I waited all day to meet him. From this you can infer my zeal to see him.
D.	To hint	H.	She did not take part in the debate except to ask a question inferring that she was not interested in the debate.

(1) A-G, B-E, C-H, D-F
(2) A-F, B-H, C-E, D-G
(3) A-H, B-G, C-E, D-F
(4) A-E, B-F, C-G, D-H

53. MELLOW

	Dictionary Definition		Usage
A.	Adequately and properly aged so as to be free of harshness	E.	He has mellowed with age.
B.	Freed from rashness of youth	F.	The tones of the old violin were mellow.
C.	Of soft and loamy consistency	G.	Some wines are mellow.
D.	Rich and full but free from stridency	H.	Mellow soil is found in the Gangetic plains.

(1) A-E, B-G, C-H, D-F
(2) A-E, B-F, C-G, D-H
(3) A-G, B-E, C-H, D-F
(4) A-H, B-G, C-F, D-E

54. RELIEF

	Dictionary Definition		Usage
A.	Removal or lightening of something distressing	E.	A ceremony follows the relief of a sentry after the morning shift.
B.	Aid in the form of necessities for the indigent	F.	It was a relief to take off the tight shoes.
C.	Diversion	G.	The only relief I get is by playing cards.
D.	Release from the performance of duty	H.	Disaster relief was offered to the victims.

(1) A-F, B-H, C-E, D-G
(2) A-F, B-H, C-G, D-E
(3) A-H, B-F, C-G, D-E
(4) A-G, B-E, C-H, D-F

55. PURGE

	Dictionary Definition		Usage
A.	Remove a stigma from the name of	E.	The opposition was purged after the coup.
B.	Make a clean sweep by removing whatever is superfluous, foreign	F.	The committee heard his attempt to purge himself of a charge of heresy.
C.	Get rid of	G.	Drugs that purge the bowels are often bad for the brain.
D.	To cause evacuation of	H.	It is recommended to purge water by distillation.

(1) A-E, B-G, C-F, D-H
(2) A-F, B-E, C-H, D-G
(3) A-H, B-F, C-G, D-E
(4) A-F, B-H, C-E, D-G

Instructions for questions 56 - 40:
Each of the questions below consists of a set of labelled sentences. These sentences, when properly sequenced, form a coherent paragraph. Choose the most logical order of sentences from among the options.

56.

A. Although there are large regional variations, it is not infrequent to find a large number of people sitting here and there and doing nothing.
B. Once in office, they receive friends and relatives who feel free to call any time without prior appointment.
C. While working, one is struck by the slow and clumsy actions and reactions, indifferent attitudes, procedure rather than outcome orientation, and the lack of consideration for others.
D. Even those who are employed often come late to the office and leave early unless they are forced to be punctual.
E. Work is not intrinsically valued in India.
F. Quite often people visit ailing friends and relatives or go out of their way to help them in their personal matters even during office hours.

(1) ECADBF (2) EADCFB
(3) EADBFC (4) ABFCBE

57.

A. But in the industrial era destroying the enemy's productive capacity means bombing the factories which are located in the cities.
B. So in the agrarian era, if you need to destroy the enemy's productive capacity, what you want to do is burn his fields, or if you're really vicious, salt them.
C. Now in the information era, destroying the enemy's productive capacity means destroying the information infrastructure.
D. How do you do battle with your enemy?
E. The idea is to destroy the enemy's productive capacity, and depending upon the economic foundation, that productive capacity is different in each case.
F. With regard to defence, the purpose of the military is to defend the nation and be prepared to do battle with its enemy.

(1) FDEBAC (2) FCABED
(3) DEBACF (4) DFEBAC

58.

A. Michael Hofman, a poet and translator, accepts this sorry fact without approval or complaint.
B. But thanklessness and impossibility do not daunt him.
C. He acknowledges too in fact he returns to the point often that best translators of poetry always fail at some level.
D. Hofman feels passionately about his work, and this is clear from his writings.
E. In terms of the gap between worth and rewards, translators come somewhere near nurses and street cleaners.

(1) EACDB (2) ADEBC
(3) EACBD (4) DCEAB

59.

A. Passivity is not, of course, universal.
B. In areas where there are no lords or laws, or in frontier zones where all men go armed, the attitude of the peasantry may well be different.
C. So indeed it may be on the fringe of the un-submissive.
D. However, for most of the soil-bound peasants the problem is not whether to be normally passive or active, but when to pass from one state to another.
E. This depends on an assessment of the political situation.

(1) BEDAC (2) CDABE
(3) EDBAC (4) ABCDE

60.

A. The situations in which violence occurs and the nature of that violence tends to be clearly defined at least in theory, as in the proverbial Irishman's question 'Is this a private fight or can anyone join in?'
B. So the actual risk to outsiders, though no doubt higher than our societies, is calculable.
C. Probably the only uncontrolled applications of force are those of social superiors to social inferiors and even here there are probably some rules.
D. However binding the obligation to kill, members of feuding families engaged in mutual massacre will be genuinely appalled if by some mischance a bystander or outsider is killed.

(1) DABC (2) ACDB
(3) CBAD (4) DBAC

Instructions for questions 61 - 65:
In each of the following sentences, parts of the sentence are left blank. Beneath each sentence, different ways of completing the sentence are indicated. Choose the best alternative among them.

61. But _____ are now regularly written not just for tools, but well-established practices, organisations and institutions, not all of which seem to be _____ away.

(1) reports, withering
(2) stories, trading
(3) books, dying
(4) obituaries, fading

62. The Darwin who _____ is most remarkable for the way in which he _____ the attributes of the world class thinker and head of the household.

(1) comes, figures
(2) arises, adds
(3) emerges, combines
(4) appeared, combines

63. Since her face was free of _____ there was no way to _____ if she appreciated what had happened.

(1) makeup, realise
(2) expression, ascertain
(3) emotion, diagnose
(4) scars, understand

64. In this context, the _____ of the British labour movement is particularly _____.

(1) affair, weird
(2) activity, moving
(3) experience, significant
(4) atmosphere, gloomy

65. Indian intellectuals may boast, if they are so inclined, of being _____ to the most elitist among the intellectual _____ of the world.

(1) subordinate, traditions
(2) heirs, cliques
(3) ancestors, societies
(4) heir, traditions

Directions for questions 66 to 70: For each of the words below, a contextual usage is provided. Pick the word from the alternatives given that is most inappropriate in the given context.

66. SPECIOUS: A specious argument is not simply a false one but one that has the ring of truth.

(1) Deceitful (2) Fallacious
(3) Credible (4) Deceptive

67. OBVIATE: The new mass transit system may obviate the need for the use of personal cars.

(1) Prevent (2) Forestall
(3) Preclude (4) Bolster

68. DISUSE: Some words fall into disuse as technology makes objects obsolete.

(1) Prevalent (2) Discarded
(3) Obliterated (4) Unfashionable

69. PARSIMONIOUS: The evidence was constructed from very parsimonious scraps of information.

(1) Frugal (2) Penurious
(3) Thrifty (4) Altruistic

70. FACETIOUS: When I suggested that war is a method of controlling population, my father remarked that I was being facetious.

(1) Jovian (2) Jovial
(3) Jocular (4) Joking

Instructions for questions 71 - 75:
The passage given below is followed by questions. Choose the best answer for each question.

The union government's present position vis-a-vis the upcoming United Nations conference on racial and related discrimination world-wide seems to be the following: discuss race please, not caste; caste is our very own and not at all as bad as you think. The gross hypocrisy of that position has been lucidly underscored by Kancha llaiah. Explicitly, the world community is to be cheated out of considering the matter on the technicality that caste is not as a concept, tantamount to a racial category. Internally, however, allowing the issue to be put on agenda at the said conference would, we are patriotically admonished, damage the country's image. Somehow, India's virtual beliefs elbow out concrete actualities. Inverted representations, as we know, have often been deployed in human histories as balm for the forsaken– religion being the most persistent of such inversions. Yet, we would humbly submit that if globalising our markets are thought good for the 'national' pocket, globalising our social inequities might not be so bad for the mass of our people. After all, racism was as uniquely institutionalised in South Africa as caste discrimination has been within our society; why then can't we permit the world community to express itself on the latter with a fraction of the zeal with which, through the years, we pronounced on the former?

As to the technicality about whether or not caste is admissible into an agenda about race (that the conference is also about 'related discriminations' tends to be forgotten), a reputed sociologist has recently argued that where race is a 'biological' category caste is a 'social' one. Having earlier fiercely opposed implementation of the Mandal Commission Report, the said sociologist is at least to be complemented now for admitting, however tangentially, that caste discrimination is a reality, although, in his view, incompatible with racial discrimination. One would like quickly to offer the hypothesis that biology, in important ways that affect the lives of many millions, is in itself perhaps a social construction. But let us look at the matter in another way.

If it is agreed- as per the positions today at which anthropological and allied scientific determinations rest- that the entire race of homo sapiens derived from an originally black African female (called 'Eve') then one is hard put to understand how, on some subsequent ground, ontological distinctions are to be drawn either between races or castes. Let us also underline the distinction between the supposition that we are all god's children and the rather more substantiated argument about our descent from 'Eve', lest both positions are thought to be equally diversionary. It then stands for reason that all subsequent distinctions are, in modern parlance, 'constructed' ones, and, like all ideological constructions, attributable to changing equations between knowledge and power among human communities through contested histories here, there, and elsewhere.

This line of thought receives, thankfully, extremely consequential buttress from the findings of the Human Genome Project. Contrary to earlier (chiefly 19th century colonial) persuasions on the subject of race, as well as, one might add, the somewhat infamous Jensen offerings in the 20th century from America, those findings deny genetic difference between 'races'. If anything, they suggest that environmental factors impinge on gene-function, as a dialectic seems to unfold between nature and culture. It would thus seem that 'biology' as the constitution of pigmentation enters the picture first only as a part of that dialectic. Taken together, the originally mother stipulation and the Genome findings ought indeed to furnish ground for human equality across the board,

as well as yield policy initiatives towards equitable material dispensations aimed at building a global order where, in Hegel's stirring formulation, only the rational constitutes the right. Such, sadly, is not the case as everyday fresh arbitrary grounds for discrimination are constructed in the interests of sectional dominance.

71. When the author writes "globalising our social inequities", the reference is to

(1) going beyond an internal deliberation on social inequity.
(2) dealing with internal poverty through the economic benefits of globalisation.
(3) going beyond an internal delimitation of social inequity.
(4) achieving disadvantaged people's empowerment, globally.

72. According to the author, 'inverted representations as balm for the forsaken'

(1) is good for the forsaken and often deployed in human histories.
(2) is good for the forsaken, but not often deployed historically for the oppressed.
(3) occurs often as a means of keeping people oppressed.
(4) occurs often to invert the status quo.

73. Based on the passage, which broad areas unambiguously fall under the purview of the UN conference being discussed?

A. Racial prejudice.
B. Racial pride.
C. Discrimination, racial or otherwise.
D. Caste-related discrimination.
E. Race-related discrimination.

(1) A, E (2) C, E
(3) A, C, E (4) B, C, D

74. According to the author, the sociologist who argued that race is a 'biological' category and caste is a 'social' one;

(1) generally shares the same orientation as the author's on many of the central issues discussed.
(2) tangentially admits to the existence of "caste" as a category.
(3) admits the incompatibility between the people of different race and caste.
(4) admits indirectly that both caste-based prejudice and racial discrimination exist.

75. An important message in the passage, if one accepts a dialectic between nature and culture, is that;

(1) the results of the Human Genome Project reinforces racial differences.
(2) race is at least partially a social construct.
(3) discrimination is at least partially a social construct.
(4) caste is at least partially a social construct.

Instructions for questions 76 - 80:
The passage given below is followed by questions. Choose the best answer for each question.

Studies of the factors governing reading development in young children have achieved a remarkable degree of consensus over the past two decades. This consensus concerns the causal role of phonological skills in young children's reading progress. Children who have poor phonological skills, progress more poorly. In particular, those who have a specific phonological deficit are likely to be classified as dyslexic by the time that they are 9 or 10 years old.
Phonological skills in young children can be measured at a number of different levels. The term phonological awareness is a global one, and refers to a deficit in recognising smaller units of sound within spoken words. Developmental work has shown that this deficit can be at the level of syllables, of onsets and rimes, or of phonemes. For example, a 4-year old child might have difficulty in recognising that a word like valentine has three syllables, suggesting a lack of syllabic awareness. A 5 year old might have difficulty in recognising that the odd word out in the set of words fan, cat, hat, mat is fan. This task requires an awareness of the sub-syllabic units of the onset and

the rime. The onset corresponds to any initial consonants is a syllable, and the rime corresponds to the vowel and to any following consonants. Rimes correspond to rhyme in single-syllable words, and so the rime in fan differs from the rime in cat, hat, and mat. In longer words, rime and rhyme may differ. The onsets in val : en : tine are /v/ and /t/, and the rimes correspond to the spelling patterns 'al', 'en', and 'ine'.

A 6-year-old might have difficulty in recognising that plea and pray begin with the same initial sound. This is a phonemic judgement. Although the initial phoneme /p/ is shared between the two words, in plea it is part of onset 'pl', and in pray it is part of the onset 'pr'. Until children can segment the onset (or the rime), such phonemic judgements are difficult for them to make. In fact, a recent survey of different developmental studies has shown that the different levels of phonological awareness appear to emerge sequentially. The awareness of syllables, onsets, and rimes appears to emerge at around the ages of 3 and 4, long before most children go to school. The awareness of phonemes, on the other hand, usually emerges at around the age of 5 or 6, when children have been taught to read for about a year. An awareness of onsets and rimes thus appears to be a precursor of reading, whereas an awareness of phonemes at every serial position in a word only appears to develop as reading is taught. The onset-rime and phonemic levels of phonological structure, however, are not distinct. Many onsets in English are single phonemes, and so are some rimes (e.g. sea, go, zoo).

The early availability of onsets and rimes is supported by studies that have compared the development of phonological awareness of onsets, rimes, and phonemes in the same subjects using the same phonological awareness tasks. For example, a study by Treiman and Zudowski used a same/different judgement task based on the beginning or the end sounds of words. In the beginning sound task, the words either began with the same onset, as in plea and plank, or shared only the initial phoneme, as in plea and pry. In the end-sound task, the words either shared the entire rime, as in spit and wit, or shared only the final phoneme, as in rat and wit. Treiman and Zudowski showed that 4–and 5–year old children found the onset-rime version of the same/different task significantly easier than the version based on phonemes. Only the 6-year-olds, who had been learning to read for about a year, were able to perform both versions of the tasks with an equal level of success.

76. From the following statements, pick out the true statement according to the passage:

(1) A mono-syllabic word can have only one onset.
(2) A mono-syllabic word can have only one rhyme but more than one rime.
(3) A mono-syllabic word can have only one phoneme.
(4) All of the above.

77. Which one of the following is likely to emerge last in the cognitive development of a child?

(1) Rhyme (2) Rime
(3) Onset (4) Phoneme

78. A phonological deficit in which of the following is likely to be classified as dyslexia?

(1) Phonemic judgement
(2) Onset judgement
(3) Rime judgement
(4) Any one or more of the above

79. The Treiman and Zudowski experiment found evidence to support the following:

(1) at age 6, reading instruction helps children perform, both, the same-different judgement task.
(2) the development of onset-rime awareness precedes the development of an awareness of phonemes.
(3) at age 4-5 children find the onset-rime version of the same/different task significantly easier.
(4) the development of onset-rime awareness is a necessary and sufficient condition for the development of an awareness of phonemes.

80. The single-syllable words Rhyme and Rime are constituted by the exact same set of

A. rime (s)
B. onset (s)
C. rhyme (s)
D. phonemes (s)

(1) A, B (2) A, C
(3) A, B, C (4) B, C, D

Instructions for questions 81 - 84:
The passage given below is followed by questions. Choose the best answer for each question.

Billie Holiday died a few weeks ago. I have been unable until now to write about her, but since she will survive many who receive longer obituaries, a short delay in one small appreciation will not harm her or us. When she died we the musicians, critics, all who were ever transfixed by the most heart-rending voice of the past generation–grieved bitterly. There was no reason to. Few people pursued self-destruction more wholeheartedly then she, and when the pursuit was at an end, at the age of forty-four, she had turned herself into a physical and artistic wreck. Some of us tried gallantly to pretend otherwise, taking comfort in the occasional moments when she still sounded like a ravaged echo of her greatness. Others had not even the heart to see and listen any more. We preferred to stay home and, if old and lucky enough to own the incomparable records of her heyday from 1937 to 1946, many of which are not even available on British LP, to recreate those coarse-textured, sinuous, and unbearable sad noises which gave her a sure corner of immortality. Her physical death called, if anything, for relief rather than sorrow. What sort of middle age would she have faced without the voice to earn money for her drinks and fixes, without the looks and in her day she was hauntingly beautiful to attract the men she needed, without business sense, without anything but the disinterested worship of ageing men had heard and seen her in her glory?

And yet, irrational though it is, our grief expressed Billie Holiday's art, that of a woman for whom one must be sorry. The great blues singers, to whom she may be justly compared, played their game from strength. Lionesses, though often wounded or at bay (did not Bessie Smith call herself 'a tiger, ready to jump'?), their tragic equivalents were Cleopatra and Phaedra; Holiday's was an embittered Ophelia. She was the Puccini heroine among blues singers, or rather among jazz singers, for though she sang a cabaret version of the blues incomparably, her natural idiom was the pop song. Her unique achievement was to have twisted this into a genuine expression of the major passions by means of a total disregard of its sugary tunes, or indeed or any tune other than her own few delicately crying elongated notes, phrased like Bessie Smith or Louis Armstrong in sackcloth, song in a thin, gritty, haunting voice whose natural mood was an unresigned and voluptuous welcome for the pains of love. Nobody has sung, or will sing, Bess's songs from Porgy as she did. It was this combination of bitterness and physical submission, as of someone lying still while watching his legs being amputated, which gives such a bloodcurdling quality to her Strange Fruit, the anti-lynching poem which she turned into an unforgettable art song. Suffering was her profession; but she did not accept it.

Little need be said about her horrifying life, which she described with emotional, though hardly with factual, truth in her autobiography Lady Sings the Blues. After an adolescence in which self-respect was measured by a girl's insistence on picking up the coins thrown on her by clients with her hands, she was plainly beyond help. She did not lack it, for she had the flair and scrupulous honesty of John Hammond to launch her, the best musicians of the 1930s to accompany her-notably Teddy Wilson, Frankie Newton and Lester Young the boundless devotion of all serious connoisseurs, and much public success. It was too late to arrest a career of systematic embittered self-immolation. To be born with both beauty and self-respect in the Negro ghetto of Baltimore in 1915 was too much of a handicap, even without rape at the age of ten and drug-addiction in her teens. But, while she destroyed herself, she sang, unmelodious, profound and heartbreaking. It is impossible not to weep for her, or not to hate the world which made her what she was.

81. Why will Billie holiday survive many who receive longer obituaries?

(1) Because of her blues creations.
(2) Because she was not as self-destructive as some other blues exponents.
(3) Because of her smooth and mellow voice.
(4) Because of the expression of anger in her songs.

82. According to the author, if Billie Holiday had not died in her middle age

(1) she would have gone on to make a further mark.
(2) she would have become even richer than what she was when she died.
(3) she would have led a rather ravaged existence.
(4) she would have led a rather comfortable existence.

83. Which of the following statements is not representative of the author's opinion?

(1) Billie Holiday had her unique brand of melody.
(2) Billie Holiday's voice can be compared to other singers in certain ways.
(3) Billie Holiday's voice had a ring of profound sorrow.
(4) Billie Holiday welcomed suffering in her profession and in her life.

84. According to the passage, Billie Holiday was fortunate in all but one of the following ways

(1) she was fortunate to have been picked up young by an honest producer.
(2) she was fortunate to have the likes of Louis Armstrong and Bessie Smith accompany her.
(3) she was fortunate to posses the looks.
(4) she enjoyed success among the public and connoisseurs.

Instructions for questions 85 - 90:
The passage given below is followed by questions. Choose the best answer for each question.

The narrative of Dersu Uzala is divided into two major sections, set in 1902 and 1907, that deal with separate expeditions which Arseniev conducts into the Ussuri region. In addition, a third time frame forms a prologue to the film. Each of the temporal frames has a different focus and by shifting them Kurosawa is able to describe the encroachment of settlements upon the wilderness and the consequent erosion of Dersu's way of life. As the film opens, that erosion has already begun. The first image is a long shot of a huge forest, the trees piled upon one another by the effects of the telephoto lens so that the landscape becomes an abstraction and appears like a huge curtain of green. A title informs us that the year is 1910. This is as late into the century as Kurosawa will go. After this prologue, the events of the film will transpire even farther back in time and will presented as Arseniev's recollections. The character of Dersu Uzala is the heart of the film, his life the example that Kurosawa wishes to affirm. Yet the formal organisation of the film works to contain to close, to circumscribe that life by erecting a series of obstacles around it. The film itself is circular, opening and closing by Dersu's grave, thus sealing off the character from the modern world to which Kurosawa once so desperately wanted to speak. The multiple time frames also work to maintain a separation between Dersu and the contemporary world. We must go back farther even than 1910 to discover who he was. But this narrative structure has yet another implication. It safeguards Dersu's example, inoculates it from contamination with history, and protects it from contact with the industrialised, urban world. Time is organised by the narrative into a series of barriers, which enclose Dersu in a kind of vacuum chamber, protecting him from the social and historical dialectics that destroyed the other Kurosawa heroes. Within the film, Dersu does die, but the narrative structure attempts to immortalise him and his example, as Dersu passes from history into myth.

We see all this at work in the enormously evocative prologue. The camera down to reveal felled trees

littering the landscape and an abundance of construction. Roads and houses outline the settlement that is being built. Kurosawa cuts to a medium shot of Arseniev standing in the midst of the clearing, looking uncomfortable and disoriented. A man passing in a wagon asks him what he is done, and the explorer says he is looking for a grave. The driver replies than no one has died here, the settlement is too recent. These words enunciate the temporal rupture that the film studies. It is the beginning of things (industrial society) and the end of things (the forest), the commencement of one world so young that no one has had time yet to die and the eclipse of another, in which Dersu has died. It is his grave for which the explorer searches. His passing symbolises the new order, the development that now surrounds Arseniev. The explorer says he buried his friend three years ago, next to huge cedar and fir trees, but now they are all gone. The man on the wagon replies they were probably chopped down when the settlement was build, and he drives off. Arseniev walks to a barren, treeless spot next to a pile of bricks. As he moves, the camera tracks and pans to follow, revealing a line of freshly built houses and a woman hanging her laundry to dry. A distant train whistle is heard, and the sounds of construction in the clearing vie with the cries of birds and the rustle of wind in the trees. Arseniev pauses, looks around for the grave that once was, and murmurs desolately, "Dersu". The image now cuts farther into the past, to 1902, and the first section of the film commences, which describes Arseniev's meeting with Dersu and their friendship.

Kurosawa defines the world of the film initially upon a void, a missing presence. The grave is gone, brushed aside by a world rushing into modernism, and now the hunter exists only in Arseniev's memories. The hallucinatory dreams and visions of Dodeskaden are succeeded by nostalgic, melancholy ruminations. Yet by exploring these ruminations, the film celebrates the timelessness of Dersu's wisdom. The first section of the film has two purposes: to describe the magnificence and inhuman vastness of nature and to delineate the code of ethics by which Dersu lives and which permits him to survive in these conditions. When Dersu first appears, the other soldiers treat him with condescension and laughter, but Arseniev watches him closely and does not share their derisive response. Unlike them, he is capable of immediately grasping Dersu's extraordinary qualities. In camp, Kurosawa frames Arseniev by himself, sitting on the other side of the fire from his soldiers. While they sleep or joke among themselves, he writes in his diary and Kurosawa cuts in several point-of-view shots from his perspective of trees that appear animated and sinister as the fire light dances across their gnarled, leafless outlines. This reflective dimension, this sensitivity to the spirituality of nature, distinguishes him from the others and forms the basis of his receptivity to Dersu and their friendship. It makes his a fit pupil for the hunter.

85. How is Kurosawa able to show the erosion on Dersu's way of life?

(1) By documenting the ebb and flow of modernisation.
(2) By going back farther and farther in time.
(3) By using three different time frames and shifting them.
(4) Through his death in a distant time.

86. Arseniev's search for Dersu's grave

(1) is part of the beginning of the film.
(2) symbolises the end of the industrial society.
(3) is misguided since the settlement is too new.
(4) symbolises the rediscovery of modernity.

87. The film celebrates Dersu's wisdom

(1) by exhibiting the moral vacuum of the pre-modern world.
(2) by turning him into a mythical figure.
(3) through hallucinatory dreams and visions.
(4) through Arseniev's nostalgic, melancholy ruminations.

88. According to the author the section of the film following the prologue

(1) serves to highlight the difficulties that Dersu faces that eventually kills him.
(2) shows the difference in thinking between Arseniev and Dersu.
(3) shows the code by which Dersu lives that allows him to survive his surroundings.
(4) serves to criticize the lack of understanding of nature in the pre-modern era.

89. In the film, Kurosawa hints at Arseniev's reflective and sensitive nature

(1) by showing him as not being derisive towards Dersu, unlike other soldiers.
(2) by showing him as being aloof from other soldiers.
(3) through shots of Arseniev writing his diary, framed by trees.
(4) all of the above.

90. According to the author, which of these statements about the film are correct?

(1) The film makes its arguments circuitously.
(2) The film highlights the insularity of Arseniev.
(3) The film begins with the absence of its main protagonist.
(4) None of the above

Instructions for questions 91 - 96:
The passage given below is followed by questions. Choose the best answer for each question.

Democracy rests on a tension between two different principles. There is, on the one hand, the principle of equality before the law, or, more generally, of equality, and, on the other, what may be described as the leadership principle. The first gives priority to rules and the second to persons. No matter how skilfully we contrive our schemes; there is a point beyond which the one principle cannot be promoted without some sacrifice of the other.
Alexis de Tocqueville, the great nineteenth century writer on democracy, maintained that the age of democracy, whose birth he was witnessing, would also be the age of mediocrity: in saying this he was thinking primarily of a regime of equality governed by impersonal rules. Despite his strong attachment to democracy, he took great pains to point out what he believed to be its negative side: a dead level plane of achievement in practically every sphere of life. The age of democracy would, in his view, be an unheroic age; there would not be room in it for either heroes or hero-worshippers.

But modern democracies have not been able to do without heroes: this too was foreseen, with much misgiving, by Tocqueville. Tocqueville viewed this with misgiving because he believed, rightly or wrongly, that unlike in aristocratic societies there was no proper place in a democracy for heroes and, hence, when they arose they would sooner or later turn into despots. Whether they require heroes or not, democracies certainly require leaders, and, in the contemporary age, breed them in great profusion; the problem is to know what to do with them.

In a world preoccupied with scientific rationality the advantages of a system based on an impersonal rule of law should be a recommendation with everybody. There is something orderly and predictable about such a system. When life is lived mainly in small, self-contained communities, men are able to take finer personal distinctions into account in dealing with their fellow men. They are unable to do this in a large and amorphous society, and organised living would be impossible here without a system of impersonal rules. Above all, such a system guarantees a kind of equality to the extent that everybody, no matter in what station of life, is bound by the same explicit, often written, rules, and nobody is above them.
But a system governed solely by impersonal rules can at best ensure order and stability; it cannot create any shining vision of a future in which mere formal equality will be replaced by real equality and fellowship. A world governed by impersonal rules cannot easily change itself, or when it does, the change is so gradual as to make the basic and fundamental feature of society appear unchanged. For any kind of basic or fundamental change, a push is needed from within, a kind of individual initiative which will create new rules, new terms and

conditions of life.

The issue of leadership thus acquires crucial significance in the context of change. If the modern age is preoccupied with scientific rationality, it is no less preoccupied with change. To accept what exists on its own terms is traditional, not modern, and it may be all very well to appreciate tradition in music, dance and drama, but for society as a whole the choice has already been made in favour of modernisation and development. Moreover, in some countries the gap between ideal and reality has become so great that the argument for development and change is now irresistible.

In these countries no argument for development has greater appeal to urgency than the one which shows development to be the condition for the mitigation, if not the elimination, of inequality. There is something contradictory about the very presence of large inequalities in a society which professes to be democratic. It does not take people too long to realise that democracy by itself can guarantee only formal equality; beyond this, it can only whet people's appetite for real or substantive equality. From this arises their continued preoccupation with plans and schemes that will help to bridge the gap between the ideal of equality and the reality which is so contrary to it.

When pre-existing rules give no clear directions of change, leadership comes into its own. Every democracy invests its leadership with a measure of charisma, and expects from it a corresponding measure of energy and vitality. Now, the greater the urge for change in a society the stronger the appeal of a dynamic leadership in it. A dynamic leadership seeks to free itself from the constraints of existing rules; in a sense that is the test of dynamism. In this process it may take a turn at which it ceases to regard itself as being bound by these rules, placing itself above them. There is always a tension between 'charisma' and 'discipline' in the case of a democratic leadership, and when this leadership puts forward revolutionary claims, the tension tends to be resolved at the expense of discipline.

Characteristically, the legitimacy of such a leadership rests on its claim to be able to abolish or at least substantially reduce the existing inequalities in society. From the argument that formal equality or equality before the law is but a limited good, it is often one short step to the argument that it is a hindrance or an obstacle to the establishment of real or substantive equality. The conflict between a 'progressive' executive and a 'conservative' judiciary is but one aspect of this larger problem. This conflict naturally acquires added piquancy when the executive is elected and the judiciary appointed.

91. Dynamic leaders are needed in democracies because

(1) they have adopted the principles of 'formal' equality rather than 'substantive' equality.
(2) 'formal' equality whets people's appetite for 'substantive' equality.
(3) systems that rely on the impersonal rules of 'formal' equality lose their ability to make large changes.
(4) of the conflict between a 'progressive' executive and a 'conservative' judiciary.

92. What possible factor would a dynamic leader consider a 'hindrance' in achieving the development goals of a nation?

(1) Principle of equality before the law.
(2) Judicial activism.
(3) A conservative judiciary.
(4) Need for discipline.

93. Which of the following four statements can be inferred from the above passage?

A. Scientific rationality is an essential feature of modernity.
B. Scientific rationality results in the development of impersonal rules.
C. Modernisation and development have been chosen over traditional music, dance and drama.
D. Democracies aspire to achieve substantive equality.

(1) A, B, D but not C
(2) A, B but not C, D
(3) A, D but not B, C
(4) A, B, C but not D

94. Tocqueville believed that the age of democracy would be an unheroic age because

(1) democratic principles do not encourage heroes.
(2) there is no urgency for development in democratic countries.
(3) heroes that emerged in democracies would become despots.
(4) aristocratic society had a greater ability to produce heroes.

95. A key argument the author is making is that:

(1) in the context of extreme inequality, the issue of leadership had limited significance.
(2) democracy is incapable of eradicating inequality.
(3) formal equality facilitates development and change.
(4) impersonal rules are good for avoiding instability but fall short of achieving real equality.

96. Which of the following four statements can be inferred from the above passage?

A. There is conflict between the pursuit of equality and individuality.
B. The disadvantages of impersonal rules can be overcome in small communities.
C. Despite limitations, impersonal rules are essential in large systems.
D. Inspired leadership, rather than plans and schemes, is more effective in bridging inequality.

(1) B, D but not A, C
(2) A, B but not C, D
(3) A, D but not B, C
(4) A, C but not B, D

Instructions for questions 97 - 100:
The passage given below is followed by questions. Choose the best answer for each question.

In the modern scientific story, light was created not once but twice. The first time was in the Big Bang, when the universe began its existence as a glowing, expanding, fireball, which cooled off into darkness after a few million years. The second time was hundreds of millions of years later, when the cold material condensed into dense nuggets under the influence of gravity, and ignited to become the first stars.
Sir Martin Rees, Britain's astronomer royal, named the long interval between these two enlightenments the cosmic "Dark Age". The name describes not only the poorly lit conditions, but also the ignorance of astronomers about that period. Nobody knows exactly when the first stars formed, or how they organised themselves into galaxies-or even whether stars were the first luminous objects. They may have been preceded by quasars, which are mysterious, bright spots found at the centres of some galaxies.

Now, two independent groups of astronomers, one led by Robert Becker of the University of California, Davis, and the other by George Djorgovski of Caltech, claim to have peered far enough into space with their telescopes (and therefore backwards enough in time) to observe the closing days of the Dark Age.
The main problem that plagued previous efforts to study the Dark Age was not the lack of suitable telescopes, but rather the lack of suitable things at which to point them. Because these events took place over 13 billion years ago, if astronomers are to have any hope of unravelling them they must study objects that are at least 13 billion light years away. The best prospects are quasars, because they are so bright and compact that they can be seen across vast stretches of space. The energy source that powers a quasar is unknown, although it is suspected to be the intense gravity of a giant black hole. However, at the distances required for the study of Dark Age, even quasars are extremely rare and faint.

Recently some members of Dr. Becker's team announced their discovery of the four most distant quasars known. All the new quasars are terribly faint, a challenge that both teams overcome by peering at them through one of the twin Keck telescopes in Hawaii. These are the world's largest, and can therefore collect the most light. The new work by Dr. Becker's team analysed the light from all four quasars. Three of them appeared to be similar to

ordinary, less distant quasars. However, the fourth and most distant, unlike any other quasar ever seen, showed unmistakable signs of being shrouded in a fog of hydrogen gas. This gas is leftover material from the Big Bang that did not condense into stars or quasars. It acts like fog because new-born stars and quasars emit mainly ultraviolet light, and hydrogen gas is opaque to ultraviolet. Seeing this fog had been the goal of would-be Dark Age astronomers since 1965, when James Gunn and Bruce Peterson spelled out the technique for using quasars as backlighting beacons to observe the fog's ultraviolet shadow.

The fog prolonged the period of darkness until the heat from the first stars and quasars had the chance to ionise the hydrogen (breaking it into its constituent parts, protons and electrons). Ionised hydrogen is transparent to ultraviolet radiation, so at that moment the fog lifted and the universe became the well-lit place it is today. For this reason, the end of the Dark Age is called the "Epoch of Re-ionisation". Because the ultraviolet shadow is visible only in the most distant of four quasars, Dr. Becker's team concluded that the fog had dissipated completely by the time the universe was about 900 million years old, and one-seventh of its current size.

97. In the passage, the Dark Age refers to:

(1) the period when the universe became cold after the Big Bang.
(2) a period about which astronomers know very little.
(3) the medieval period when cultural activity seemed to have come to an end.
(4) the time that the universe took to heat up after the Big Bang.

98. Astronomers find it difficult to study the Dark Age because:

(1) suitable telescopes are few.
(2) the associated events took place aeons ago.
(3) the energy source that powers a quasar is unknown.
(4) their best chance is to study quasars, which are faint object to begin with.

99. The four most distant quasars discovered recently

(1) could only be seen with the help of large telescopes.
(2) appear to be similar to other ordinary, quasars.
(3) appear to be shrouded in a fog of hydrogen gas.
(4) have been sought to be discovered by Dark Age astronomers since 1965.

100. The fog of hydrogen gas seen through the telescopes

(1) is transparent to hydrogen radiation from stars and quasars in all states.
(2) was lifted after heat from stars and quasars ionised it.
(3) is material which eventually became stars and quasars.
(4) is broken into constituent elements when stars and quasars are formed

Section III

Answer questions 101 to 104 based on the following information:

The following is a table describing garments manufactured based upon the colour and size each lay. There are four sizes: M-Medium, L-Large, XL-Extra Large and XXL-Extra Extra Large. There are three colours: Yellow, Red and White.

Lay	Number of Garments											
	Yellow				Red				White			
Lay No.	M	L	XL	XXL	M	L	XL	XXL	M	L	XL	XXL
1	14	14	7	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	42	42	21	0
3	20	20	10	0	18	18	9	0	0	0	0	0
4	20	20	10	0	0	0	0	0	30	30	15	0
5	0	0	0	0	24	24	12	0	30	30	15	0
6	22	22	11	0	24	24	12	0	32	32	16	0
7	0	24	24	12	0	0	0	0	0	0	0	0
8	0	20	20	10	0	2	2	1	0	0	0	0
9	0	20	20	10	0	0	0	0	0	22	22	11
10	0	0	0	0	0	26	26	13	0	20	20	10
11	0	22	22	11	0	26	26	13	0	22	22	11
12	0	0	2	2	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	20	20
14	0	0	0	0	0	0	0	0	0	0	22	22
15	0	0	10	10	0	0	2	2	0	0	22	22
16	0	0	0	0	1	0	0	0	1	0	0	0
17	0	0	0	0	0	5	0	0	0	0	0	0
18	0	0	0	0	0	32	0	0	0	0	0	0
19	0	0	0	0	0	32	0	0	0	0	0	0
20	0	0	0	0	0	5	0	0	0	0	0	0
21	0	0	0	18	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	26	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	22
24	0	0	0	8	0	0	0	1	0	0	0	0
25	0	0	0	8	0	0	0	0	0	0	0	12
26	0	0	0	0	0	0	0	1	0	0	0	14
27	0	0	0	8	0	0	0	2	0	0	0	12
Production	76	162	136	97	67	194	89	59	135	198	195	156
Order	75	162	135	97	67	194	89	59	135	198	195	155
Surplus	1	0	1	0	0	0	0	0	0	0	0	1

101. How many lays are used to produce Yellow-coloured fabrics?

(1) 10 (2) 11 (3) 12 (4) 14

102. How many lays are used to produce Extra-Extra Large fabrics?

(1) 15 (2) 16 (3) 17 (4) 18

103. How many lays are used to produce Extra-Extra Large Yellow or Extra-Extra Large White fabrics?

(1) 8 (2) 9 (3) 10 (4) 15

104. How many varieties of fabrics, which exceed the order have been produced?

(1) 3 (2) 4 (3) 5 (4) 6

Answer questions 105 to 108 based on the following information:

Answer these questions based on the table given below concerning the twenty busiest international airports in the world.

No.	Name	International Airport Type	Code	Location	Passengers
1	Hartsfield	A	ATL	Atlanta, Georgia, USA	77939536
2	Chicago-O'Hare	A	ORD	Chicago, Illinois, USA	72568076
3	Los Angeles	A	LAX	Los Angeles, California	63876561
4	Heathrow Airport	E	LHR	London, United Kingdom	62263710
5	DFW	A	DFW	Dallas Ft. Worth, Texas, USA	60000125
6	Haneda Airport	F	HND	Tokyo, Japan	54338212
7	Frankfurt Airport	E	FRA	Frankfurt, Germany	45858315
8	Roissy-Charles de	E	CDG	Paris, France	43596943
9	San Francisco	A	SFO	San Francisco, California, USA	40387422
10	Denver	A	DIA	Denver, Colorado, USA	38034231
11	Amsterdam	E	AMS	Amsterdam, Netherlands	36781015
12	Minneapolis-St.	A	MSP	Minneapolis-St. Paul, USA	34216331
13	Detroit Metropolitan	A	DTW	Detroit, Michigan, USA	34038381
14	Miami	A	MIA	Miami, Florida, USA	33899246
15	Newark	A	EWR	Newark, New Jersey, USA	33814000
16	McCarran	A	LAS	Las Vegas, Nevada, USA	33669185
17	Phoenix Sky Harbor	A	PHX	Phoenix, Arizona, USA	33533353
18	Kimpo	E	SEL	Seoul, Korea	33371074
19	George Bush	A	LAH	Houston, Texas, USA	33089333
20	John F. Kennedy	A	JFK	New York	32003000

105. How many international airports of type 'A' account for more than 40 million passengers?

(1) 4 (2) 5 (3) 6 (4) 7

106. What percentage of top ten busiest airports is in the United States of America?

(1) 60 (2) 80 (3) 70 (4) 90

107. Of the five busiest airports, roughly what percentage of passengers is handled by Heathrow airport?

(1) 30 (2) 40 (3) 20 (4) 50

108. How many international airports not located in the USA handle more than 30 million passengers?

(1) 5 (2) 6 (3) 10 (4) 14

Answer questions 109 to 114 based on the following information:

Figure 1 shows the amount of work distribution, in man-hours, for a software between offshore and onsite activities. Figure 2 shows the estimated and actual work effort involved in the different offshore activities in the same company during the same period. [Note: Onsite refers to work performed at the customer's premise and offshore refers to work performed at the developer's premise.]

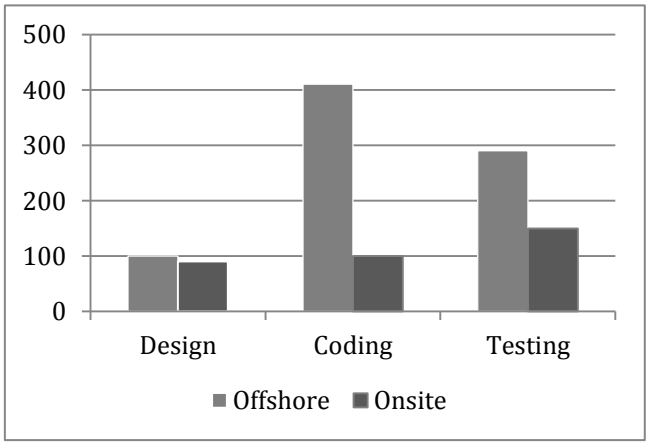


Figure 1

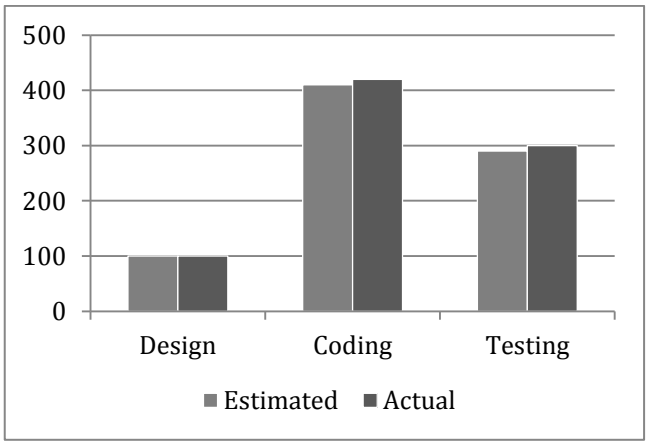


Figure 2

109. Which of the work requires as many man-hours as that spent in coding?

(1) Offshore, design and coding
(2) Offshore coding
(3) Testing
(4) Offshore, testing and coding

110. Roughly what percentage of the total work is carried out onsite?

(1) 40 percent (2) 20 percent (3) 30 percent (4) 50 percent

111. The total effort in man-hours spent onsite is nearest to which of the following?

(1) The sum of the estimated and actual effort for offshore design
(2) The estimated man-hours of offshore coding
(3) The actual man-hours of offshore testing
(4) Half of the man-hours of estimated offshore coding

112. If the total working hours were 100, which of the following tasks will account for approximately 50 hours?

(1) Coding
(2) Design
(3) Offshore testing
(4) Offshore testing plus design

113. If 50 percent of the offshore work were to be carried out onsite, with the distribution of effort between the tasks remaining the same, the proportion of testing carried out offshore would be

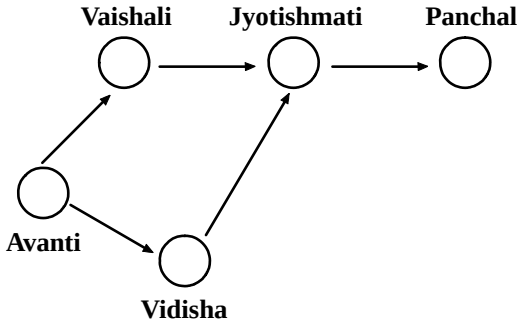
(1) 40 percent (2) 30 percent (3) 50 percent (4) 70 percent

114. If 50 percent of the offshore work were to be carried out onsite, with the distribution of effort between the tasks remaining the same, which of the following is true of all work carried out onsite?

(1) The amount of coding done is greater than that of testing
(2) The amount of coding done onsite is less than that of design done onsite
(3) The amount of design carried out onsite is greater than that of testing
(4) The amount of testing carried out offshore is greater than that of total design

Answer questions 115 to 117 based on the following information:

The following sketch shows the pipelines carrying material from one location to another. Each location has a demand for material. The demand at Vaishali is 400, at Jyotishmati is 400, at Panchal is 700, and at Vidisha is 200. Each arrow indicates the direction of material flow through the pipeline. The flow from Vaishali to Jyotishmati is 300. The quantity of material flow is such that the demands at all these locations are exactly met. The capacity of each pipeline is 1000.



115. The quantity moved from Avanti to Vidisha is

(1) 200 (2) 800 (3) 700 (4) 1000

116. The free capacity available at the Avanti-Vaishali pipeline is

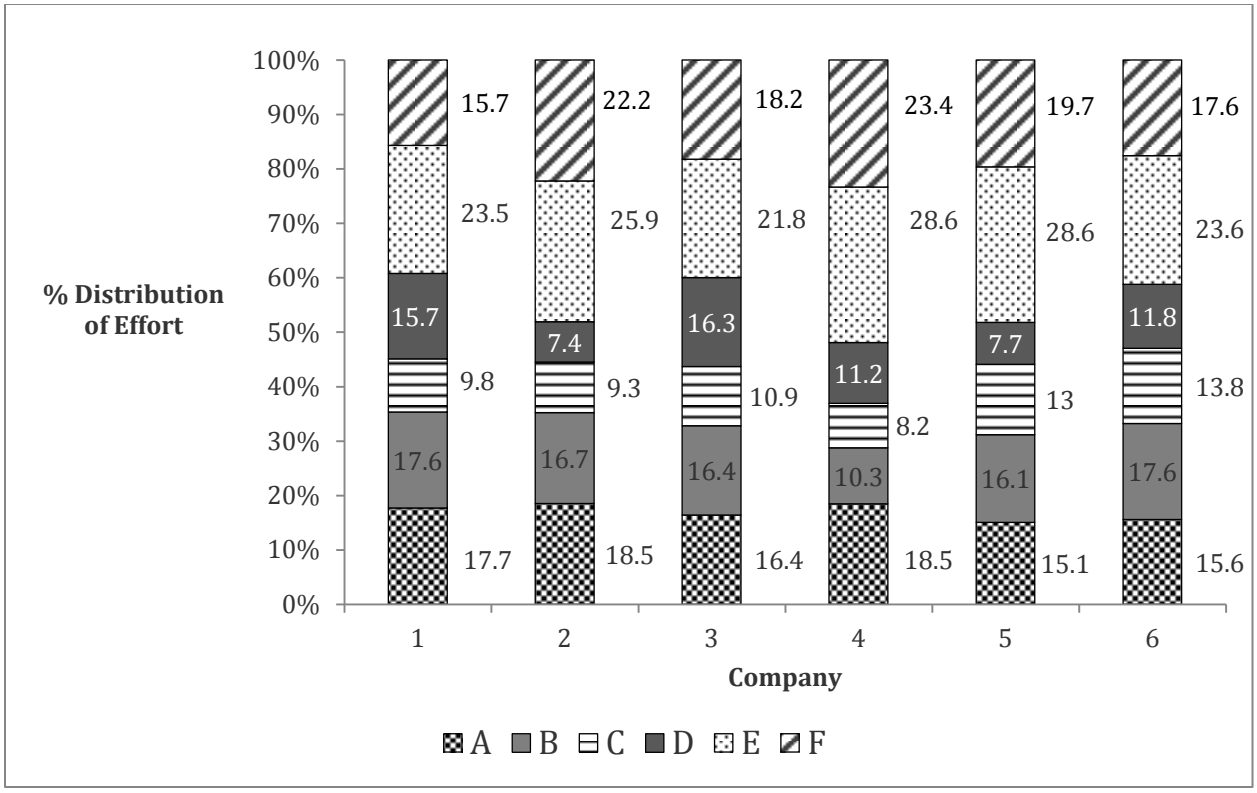
(1) 0 (2) 100 (3) 200 (4) 300

117. What is the free capacity available in the Avanti-Vidisha pipeline?

(1) 300 (2) 200 (3) 100 (4) 0

Answer questions 118 to 120 based on the following information:

There are six companies, 1 through 6. All of these companies use six operations, A through F. The following graph shows the distribution of efforts put in by each company in these six operations.



118. Suppose effort allocation is interchanged between operation B and C, then C and D, and then D and E. If companies are then ranked in ascending order of effort in E, what will be the rank of company 3?

(1) 2 (2) 3 (3) 4 (4) 5

119. A new technology is introduced in company 4 such that the total efforts for operations B through F get evenly distributed among these. What is the change in the percentage of effort in operation E?

(1) Reduction of 12.3
(2) Increase of 12.3
(3) Reduction of 5.6
(4) Increase of 5.6

120. Suppose the companies find that they can remove operations B, C and D and redistribute the effort released equally among the remaining operations. Then, which operation will show the maximum across all companies and all operations?

(1) Operation E in company 1
(2) Operation E in company 4
(3) Operation F in company 5
(4) Operation E in company 5

Answer questions 121 to 127 based on the following instructions:

Choose 1 if the question can be answered by using one of the statements alone, but cannot be answered using the other statement alone.
Choose 2 if the question can be answered by using either statement alone.
Choose 3 if the question can be answered by using both statements together, but cannot be answered using either statement alone.
Choose 4 if the question cannot be answered even by using both statements together.

121. What are the values of m and n?

A. n is an even integer, m is an odd integer, and m is greater than n.
B. Product of m and n is 30.

(1) 1 (2) 2
(3) 3 (4) 4

122. Is Country X's GDP higher than country Y's GDP?

A. GDPs of the countries X and Y have grown over the past five years at compounded annual rate of 5% and 6% respectively.
B. Five years ago, GDP of country X was higher than that of country Y.

(1) 1 (2) 2
(3) 3 (4) 4

123. What is the value of X?

A. X and Y are unequal even integers, less than 10, and X/Y is an odd integer.
B. X and Y are even integers, each less than 10, and product of X and Y is 12.

(1) 1 (2) 2
(3) 3 (4) 4

124. On a given day a boat ferried 1500 passengers across the river in twelve hours. How many round trips did it make?

A. The boat can carry two hundred passengers at any time.
B. It takes 40 minutes each way and 20 minutes of waiting time at each terminal.

(1) 1 (2) 2
(3) 3 (4) 4

125. What will be the time for downloading software?

A. Transfer rate is 6 Kilobytes per second.
B. The size of the software is 4.5 megabytes.

(1) 1 (2) 2
(3) 3 (4) 4

126. A square is inscribed in a circle. What is the difference between the area of the circle and that of the square?

A. The diameter of the circle is $25\sqrt{2}$ cm.
B. The side of the square is 25 cm.

(1) 1 (2) 2
(3) 3 (4) 4

127. Two friends, Ram and Gopal, bought apples from a wholesale dealer. How many apples did they buy?

A. Ram bought one-half the number of apples that Gopal bought.
B. The wholesale dealer had a stock of 500 apples.

(1) 1 (2) 2
(3) 3 (4) 4

Answer questions 128 to 130 based on the following information:

The questions are based on the pie charts given below. Chart 1 shows the distribution of twelve million tons of crude oil transported through different modes over a specific period of time. Chart 2 shows the distribution of the cost of transporting this crude oil. The total cost was Rs. 30 million.

Chart 1: Volume Transported

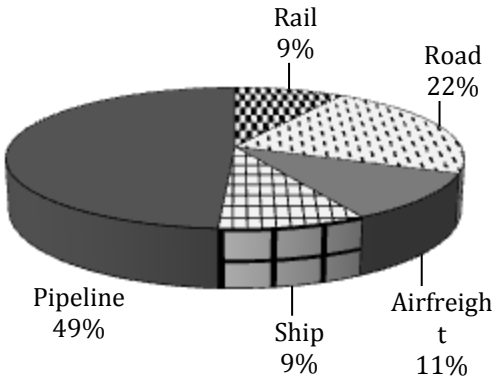
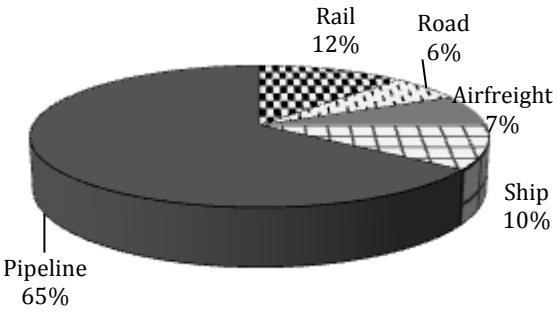


Chart 2: Cost of Transportation



128. The cost in rupees per ton of oil moved by rail and road happens to be roughly

(1) 3 (2) 1.5
(3) 4.5 (4) 8

129. From the charts given, it appears that the cheapest mode of transport is

(1) Road (2) Rail
(3) Pipeline (4) Ship

130. If the costs per ton of transport by ship, air and road are represented by P, Q and R respectively, which of the following is true?

(1) $R > Q > P$ (2) $P > R > Q$
(3) $P > Q > R$ (4) $R > P > Q$

131. At a village mela, the following six nautankis (plays) are scheduled as shown in the table below. You wish to see all the six nautankis. Further, you wish to ensure that you get a lunch break from 12:30 p.m. to 1:30 p.m. In which of the following way can you do this?

No.	Nautanki	Duration	Show Times
1	Sati-Savitri	1 hour	9:00 a.m. and 2:00 p.m.
2	Joru ka Ghulam	1 hour	10:30 a.m. and 11:30 a.m.
3	Sundar Kand	30 minutes	10:00 a.m. and 11:00 a.m.
4	Veer Abhimanyu	1 hour	10:00 a.m. and 11:00 a.m.
5	Reshma aur Shera	1 hour	9:30 a.m., 12:00 noon and 2:00 p.m.
6	Jhansi ki Rani	30 minutes	11:00 a.m. and 1:30 p.m.

(1) Sati-Savitri is viewed first; Sundar Kand is viewed third and Jhansi ki Rani is viewed last.
(2) Sati-Savitri is viewed last; Veer Abhimanyu is viewed third and Reshma aur Shera is viewed first.
(3) Sati-Savitri is viewed first; Sundar Kand is viewed third and Joru ka Ghulam is viewed fourth.
(4) Veer-Abhimanyu is viewed third; Reshma aur Shera is viewed fourth and Jhansi ki Rani is viewed fifth.

132. Mrs. Ranga has three children and has difficulty remembering their ages and the months of their birth. The clues below may help her remember.

A. The boy, who was born in June, is 7 years old.
B. One of the children is 4 years old, but it is not Anshuman.
C. Vaibhav is older than Suprita.
D. One of the children was born in September, but it was not Vaibhav.
E. Supriya's birthday is in April.
F. The youngest child is only 2 years old.

Based on the above clues, which one of the following statements is true?

(1) Vaibhav is the oldest, followed by Anshuman who was born in September, and the youngest is Supriya who was born in April.
(2) Anshuman is the oldest being born in June, followed by Supriya who is 4 years old, and the youngest is Vaibhav who is 2 years old.
(3) Vaibhav is the oldest being 7 years old, followed by Supriya who was born in April, and the youngest is Anshuman who was born in September.
(4) Supriya is the oldest who was born in April, followed by Vaibhav who was born in June, and Anshuman who was born in September.

133. The Banerjees, the Sharmas, and the Pattabhiramans each have a tradition of eating Sunday lunch as a family. Each family serves a special meal at a certain time of day. Each family has a particular set of chinaware used only for this meal. Use the clues below to answer the following question.

The Sharma family eats at noon.
The family that serves fried brinjal uses blue chinaware.
The Banerjee family eats at 2 o'clock.
The family that serves sambar does not use red chinaware.
The family that eats at 1 o'clock serves fried brinjal.
The Pattabhiraman family does not use white chinaware.
The family that eats last likes makkai-ki-roti.

Which one of the following statements is true?

(1) The Banerjees eat makkai-ki-roti at 2 o'clock, the Sharmas eat fried brinjal at 12 o'clock and the Pattabhiramans eat sambar from red chinaware.
(2) The Sharmas eat sambar served in white chinaware, the Pattabhiramans eat fried brinjal at 1 o'clock, and the Banerjees eat makkai-ki-roti served in blue chinaware.
(3) The Sharmas eat sambar at noon, the Pattabhiramans eat fried brinjal served in blue chinaware, and the Banerjees eat makkai-ki-roti served in red chinaware.
(4) The Banerjees eat makkai-ki-roti served in white chinaware, the Sharmas eat fried brinjal at 12 o'clock and the Pattabhiramans eat sambar from red chinaware.

134. While Balbir had his back turned, a dog ran into his butcher shop, snatched a piece of meat off the counter and ran out. Balbir was mad when he realised what had happened. He asked three other shopkeepers, who had seen the dog, to describe it. The shopkeepers really didn't want to help Balbir. So each of them made a statement which contained one truth and one lie.

A. Shopkeeper Number 1 said: "The dog had black hair and a long tail."
B. Shopkeeper Number 2 said: "The dog has a short tail and wore a collar."
C. Shopkeeper Number 3 said: "The dog had white hair and no collar."

Based on the above statements, which of the following could be a correct description?

(1) The dog had white hair, short tail and no collar.
(2) The dog had white hair, long tail and a collar.
(3) The dog had black hair, long tail and a collar.
(4) The dog had black hair, long tail and no collar.

Answer questions 135 and 136 based on the following information:

Elle is three times older than Yogesh. Zaheer is half the age of Wahida. Yogesh is older than Zaheer.

135. Which of the following can be inferred?

(1) Yogesh is older than Wahida.
(2) Elle is older than Wahida.
(3) Elle may be younger than Wahida.
(4) None of the above

136. Which of the following information will be sufficient to estimate Elle's age?

(1) Zaheer is 10 years old.
(2) Both Yogesh and Wahida are older than Zaheer by the same number of years.
(3) Both 1 and 2 above
(4) None of the above

Answer questions 137 to 139 based on the following instructions:

A group of three or four has to be selected from seven persons. Among are two women: Fiza and Kavita, and five men: Ram, Shyam, David, Peter and Rahim. Ram would not like to be in the group if Shyam is also selected. Shyam and Rahim want to be selected together in the group. Kavita would like to be in the group only if David is also there. David, if selected, would not like Peter in the group. Ram would like to be in the group only if Peter is also there. David insists that Fiza be selected in case he is there in the group.

137. Which of the following is a feasible group of three?

(1) David, Ram, Rahim
(2) Peter, Shyam, Rahim
(3) Kavita, David, Shyam
(4) Fiza, David, Ram

138. Which of the following is a feasible group of four?

(1) Ram, Peter, Fiza, Rahim
(2) Shyam, Rahim, Kavita, David
(3) Shyam, Rahim, Fiza, David
(4) Fiza, David, Ram, Peter

139. Which of the following statements is true?

(1) Kavita and Ram can be part of a group of four
(2) A group of four can have two women
(3) A group of four can have all four men
(4) None of the above

140. On her walk through the park, Hansa collected 50 coloured leaves, all either maple or oak. She sorted them by category when she got home, and found the following:

A. The number of red oak leaves with spots is even and positive.
B. The number of red oak leaves without any spot equals the number of red maple leaves without spots.
C. All non-red oak leaves have spots, and there are five times as many of them as there are red spotted oak leaves.
D. There are no spotted maple leaves that are not red.
E. There are exactly 6 red spotted maple leaves.
F. There are exactly 22 maple leaves that are neither spotted nor red.

How many oak leaves did she collect?

(1) 22 (2) 17
(3) 25 (4) 18

141. Eight people carrying food baskets are going for a picnic on motorcycles. Their names A, B, C, D, E, F, G, and H. They have four motorcycles, M1, M2, M3 and M4 among them. They also have four food baskets O, P, Q and R of different sizes and shapes and each can be carried only on motorcycles M1, M2, M3, or M4, respectively. No more than two persons can travel on a motorcycle and no more than one basket can be carried on a motorcycle. There are two husband-wife pairs in this group of eight people and each pair will ride on a motorcycle together. C cannot travel with A or B. E cannot travel with B or F. G cannot travel with F or H or D. The husband-wife pairs must carry baskets O and P. Q is with A and P is with D. F travels on M1 and E travels on M2 motorcycles. G

is with Q, and B cannot go with R. Who is travelling with H?

(1) A (2) B
(3) C (4) D

142. In a family gathering there are two males who are grandfathers and four males who are fathers. In the same gathering there are two females who are grandmothers and four females who are mothers. There is at least one grandson or a granddaughter present in this gathering. There are two husband-wife pairs in this group. These can either be a grandfather and a grandmother, or a father and a mother. The single grandfather (who wife is not present) has two grandsons and a son present. The single grandmother (whose husband is not present) has two granddaughters and a daughter present. A grandfather or a grandmother present with their spouses does not have any grandson or granddaughter present. What is the minimum number of people present in this gathering?

(1) 10 (2) 12
(3) 14 (4) 16

143. I have a total of Rs. 1,000. Item A costs Rs. 110, item B costs Rs. 90, item C costs Rs. 70, item D costs Rs. 40 and item E costs Rs. 45. For every item D that I purchase, I must also buy two of item B. For every item A, I must buy one of item C. For every item E, I must also buy two of item D and one of item B. For every item purchased I earn 1000 points and for every rupee not spent I earn a penalty of 1500 points. My objective is to maximise the points I earn. What is the number of items that I must purchase to maximise my points?

(1) 13 (2) 14
(3) 15 (4) 16

144. Four friends Ashok, Bashir, Chirag and Deepak are out shopping. Ashok has less money than three times the amount that Bashir has. Chirag has more money than Bashir. Deepak has an amount equal to the difference of amounts with Bashir and Chirag. Ashok has three times the money with Deepak. They each have to buy at least one shirt, or one shawl, or one sweater, or one jacket that are priced Rs. 200, Rs. 400, Rs. 600, and Rs. 1,000 a piece, respectively. Chirag borrows Rs. 300 from Ashok and buys a jacket. Bashir buys a sweater after borrowing Rs. 100 from Ashok and is left with no money. Ashok buys three shirts. What is the costliest item that Deepak could buy with his own money?

(1) A shirt (2) A shawl
(3) A sweater (4) A jacket

145. In a "keep-fit" gymnasium class there are fifteen females enrolled in a weight-loss program. They all have been grouped in any one of the five weight-groups W1, W2, W3, W4, or W5. One instructor is assigned to one weight-group only. Sonali, Shalini, Shubhra, and Shahira belong to the same weight-group. Sonali and Rupa are in one weight-group, Rupali and Renuka are also in one weight-group. Rupa, Radha, Renuka, Ruchika and Ritu belong to different weight-groups. Somya cannot be with Ritu, and Tara cannot be with Radha. Komal cannot be with Radha, Somya, or Ritu. Shahira is in W1 and Somya is in W4 with Ruchika. Sweta and Jyotika cannot be with Rupali, but are in a weight-group with total membership of four. No weight-group can have more than five or less than one member. Amita, Babita, Chandrika, Deepika, and Elina are instructors of weight-groups with membership sizes 5, 4, 3, 2 and 1, respectively. Who is the instructor of Radha?

(1) Babita (2) Elina
(3) Chandrika (4) Deepika

146. A king has unflinching loyalty from eight of his ministers M1 to M8, but he has to select only four to make a cabinet committee. He decides to choose these four such that each selected person shares a liking with at least one of the other three selected. The selected persons must also hate one of the likings of any of the other three persons selected.

A. M1 likes fishing and smoking, but hates gambling.
B. M2 likes smoking and drinking, but hates fishing.
C. M3 likes gambling, but hates smoking.
D. M4 likes mountaineering, but hates drinking.
E. M5 likes drinking, but hates smoking and mountaineering.
F. M6 likes fishing, but hates smoking and mountaineering.
G. M7 likes gambling and mountaineering, but hates fishing.
H. M8 likes smoking and gambling, but hates mountaineering.

Who are the four people selected by the king?

(1) M1, M2, M5, M6 (2) M3, M4, M5, M6
(3) M4, M5, M6, M8 (4) M1, M2, M4, M7

Answer questions 147 to 150 based on the following information:

A and B are two sets (e.g. A = mothers, B = women). The elements that could belong to both the sets (e.g. women who are mothers) is given by the set $C = A.B$. The elements which could belong to either A or B, or both, is indicated by the set $D = A \cup B$. A set that does not contain any elements is known as a null set, represented by ϕ (for example, if none of the women in the set B is a mother, they $C = A.B$ is a null set, or $C = \phi$).

Let 'V' signify the set of all vertebrates; 'M' the set of all mammals; 'D' dogs; 'F' fish; 'A' Alsatian and 'P', a dog named Pluto.

147. Given that $X = M.D$ is such that $X = D$, which of the following is true?

(1) All dogs are mammals.
(2) Some dogs are mammals.
(3) $X = \phi$
(4) All mammals are dogs.

148. If $Y = F.(D.V)$, is not a null set, it implies that

(1) All fish are vertebrates
(2) All dogs are vertebrates
(3) Some fish are dogs
(4) None of the above

149. If $Z = (P.D) \cup M$, then

(1) The elements of Z consist of Pluto the dog or any other mammal.
(2) Z implies any dog or mammal.
(3) Z implies Pluto or any dog that is a mammal.
(4) Z is a null set.

150. If $P.A = \phi$ and $P \cup A = D$, then which of the following is true?

(1) Pluto and Alsatians are dogs.
(2) Pluto is an Alsatian.
(3) Pluto is not an Alsatian.
(4) D is a null set.

Answer Key

SECTION I			
Q.	**Ans.**	**Q.**	**Ans.**
1	**3**	31	**3**
2	**2**	32	**1**
3	**1**	33	**1**
4	**4**	34	**3**
5	**1**	35	**1**
6	**3**	36	**2**
7	**2**	37	**3**
8	**1**	38	**4**
9	**4**	39	**2**
10	**1**	40	**2**
11	**1**	41	**3**
12	**4**	42	**3**
13	**1**	43	**4**
14	**3**	44	**2**
15	**2**	45	**1**
16	**4**	46	**2**
17	**4**	47	**2**
18	**4**	48	**3**
19	**1**	49	**2**
20	**4**	50	**2**
21	**3**		
22	**2**		
23	**4**		
24	**3**		
25	**2**		
26	**1**		
27	**3**		
28	**3**		
29	**1**		
30	**3**		

SECTION II			
Q.	**Ans.**	**Q.**	**Ans.**
51	**1**	81	1
52	**4**	82	3
53	**3**	83	4
54	**2**	84	2
55	**4**	85	3
56	**1**	86	**1**
57	**1**	87	**4**
58	**3**	88	**3**
59	**4**	89	**4**
60	**2**	90	**3**
61	**4**	91	**3**
62	**3**	92	**3**
63	**2**	93	**1**
64	**3**	94	**1**
65	**2**	95	**4**
66	**3**	96	**4**
67	**4**	97	**2**
68	**1**	98	**2**
69	**4**	99	**1**
70	**1**	100	**2**
71	**1**		
72	**3**		
73	**1**		
74	**4**		
75	**2**		
76	**1**		
77	**4**		
78	**4**		
79	**2**		
80	**2**		

SECTION III			
Q.	**Ans.**	**Q.**	**Ans.**
101	**4**	131	**3**
102	**2**	132	**3**
103	**4**	133	**3**
104	**1**	134	**2**
105	**2**	135	**2**
106	**1**	136	**3**
107	**3**	137	**2**
108	**2**	138	**3**
109	**1**	139	**4**
110	**3**	140	**2**
111	**3**	141	**3**
112	**1**	142	**2**
113	**2**	143	**2**
114	**1**	144	**2**
115	**4**	145	**2**
116	**4**	146	**4**
117	**4**	147	**1**
118	**2**	148	**3**
119	**1**	149	**1**
120	**4**	150	**3**
121	**3**		
122	**4**		
123	**1**		
124			
125	**1**		
126	**3**		
127	**4**		
128	**2**		
129	**1**		
130	**3**		

3

PREVIOUS CAT QUESTION PAPER

CAT 2002

Before the Test:

1. DO NOT REMOVE THE SEAL OF THIS BOOKLET UNTIL THE SIGNAL TO START IS GIVEN.
2. Keep only a pencil, eraser and sharpener with you. DO NOT KEEP with you books, rulers, slide rules, drawing instruments, calculators (including watch calculators), pagers, cellular phones, stop watches or any other device or loose paper. These should be left at a place indicated by the invigilator.
3. Use only HB pencil to fill in the Answer Sheet.
4. Enter in your Answer Sheet: (a) in Box 3, the Test Form Number that appears at the bottom of this page, (b) in Box 4, the Test Booklet Serial Number that appears at the top of this page.
5. Ensure that your personal data have been entered correctly on Side - II of the Answer Sheet.
6. Ensure that you have entered your 8-digit Test Registration Number in Box 2 of the Answer Sheet correctly. Start entering the number from the leftmost cell, leaving the last three cells blank.

At the start of the Test:

1. As soon as the signal to start is given, open the Test Booklet.
2. This Test Booklet contains 33 pages, including the blank ones. Immediately after opening the Test Booklet, verify that all the pages are printed properly and are in order. If there is a problem with your Test Booklet, immediately inform the invigilator. You will be provided with a replacement.

How to answer:

1. This test contains 150 questions in three sections. **There are 50 questions in Section I, 50 questions in Section II and 50 questions in Section III**. You have two and half hours to complete the test. In distributing the time over the three sections, please bear in mind that you need to demonstrate your competence in all three sections.
2. Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles on the Answer Sheet. Each question has only one correct answer.
3. **All Questions carry one mark each. For a wrong answer you will lose one-third of the marks allotted to the question.**
4. Do your rough work only on the Test Booklet and NOT on the Answer Sheet.
5. Follow the instructions of the invigilator. Students found violating the instructions will be disqualified.

After the Test:

1. At the end of the test, remain seated. The invigilator will collect the Answer Sheet from your seat. Do not leave the hall until the invigilator announces "You may leave now". The invigilator will make this announcement only after collecting the Answer Sheets from all the students in the room.
2. You may retain this Test Booklet with you.

Test Form Number: 111

Section I

Instructions for questions 1 - 5:
The passage given below is followed by questions. Choose the best answer for each question.

Cells are the ultimate multitaskers: they can switch on genes and carry out their orders, talk to each other, divide in two and much more, all at the same time. But they couldn't do any of these tricks without a power source to generate movement. The inside of a cell bustles with more traffic than Delhi roads, and, like all vehicles, the cell's moving parts need engines. Physicists and biologists have looked "under the hood" of the cell- and laid out the nuts and bolts of molecular engines.
The ability of such engines to convert chemical energy into motion is the envy of nanotechnology researchers looking for ways to power molecule-sized devices. Medical researchers also want to understand how these engines work. Because these molecules are essential for cell division, scientists hope to shut down the rampant growth of cancer cells by deactivating certain motors. Improving motor-driven transport in nerve cells may also be helpful for treating diseases such as Alzheimer's, Parkinson's or ALS, also known as Lou Gehrig's disease.

We wouldn't make it far in life without motor proteins. Our muscles wouldn't contract. We couldn't grow, because the growth process requires cells to duplicate their machinery and pull the copies apart. And our genes could be silent without the services of messenger RNA, which carries genetic instructions over to the cell's protein-making factories. The movements that make these cellular activities possible occur along a complex network of threadlike fibers, or polymers, along which bundles of molecules travel like trams. The engines that power the cell's freight are three families of proteins, called myosin, kinesin and dynein. For fuel, these proteins burn molecules of ATP, which cells make when they break down the carbohydrates and fats from the foods we eat. The energy from burning ATP causes changes in the proteins' shape that allow them to heave themselves on the polymer track. The results are impressive: In one second, these molecules can travel between 50 and 100 times their own diameter. If a car with a 5-foot-wide engine were as efficient, it would travel 170 to 340 kmph.

Ronald Vale, a researcher at the Howard Hughes Medical Institute and the University of California at San Francisco, and Ronald Milligan of the Scripps Research Institute have realized a long-awaited goal by reconstructing the process by which myosm and kinesm move, almost down to the atom. The dynein motor, on the other hand, is still poorly understood. Myosin molecules, best known for their role in muscle contraction, form chains that lie between filaments of another protein called actin. Each myosin molecule has a tiny head that pokes out from the chain like oars from a canoe. Just as rowers propel their boat by stroking their oars through the water, the myosin molecules stick their heads into the actin and hoist themselves forward along the filament. While myosin moves along in short strokes, its cousin kinesin walks steadily along a different type of filament called a microtubule. Instead of using a projecting head as a lever, kinesin walks on two "legs." Based on these differences, researchers used to think that myosin and kinesin were virtually unrelated. But newly discovered similarities in the motors' ATP-processing machinery now suggest that they share a common ancestor-molecule. At this point, scientists can only speculate as to what type of primitive cell-like structure this ancestor occupied as learned to burn ATP and use the energy to change shape. "We'll never really know, because we can't dig up the mains of ancient proteins, but that was probably a big evolutionary leap," says Vale.

On a slightly larger scale, loner cells like sperm or infectious bacteria are prime movers that resolutely push their way through to other cells. As L. Mahadevan and Paul Matsudaira of the Massachusetts Institute of Technology explain, the engines in this case are springs or ratchets that are clusters of molecules, rather than single proteins like myosin and kinesin. Researchers don't yet fully understand these engines fueling process or the details of how they move, but the result is a force to be reckoned

with. For example, one such engine is a spring like stalk connecting a single-celled organism called a vorticellid to the leaf fragment it calls home. When exposed to calcium, the spring contracts, yanking the vorticellid down at speeds approaching 3 inches (8 centimeters) per second.

Springs like this are coiled bundles of filaments that expand or contract in response to chemical cues. A wave of positively charged calcium ions, for example, neutralizes the negative charges that keep the filaments extended. Some sperm use spring like engines made of actin filaments to shoot out a barb that penetrates the layers that surround an egg. And certain viruses use a similar apparatus to shoot their DNA into the host's cell. Ratchets are also useful for moving whole cells, including some other sperm and pathogens. These engines are filaments that simply grow at one end, attracting chemical building blocks from nearby. Because the other end is anchored in its place, the growing end pushes against any barrier that gets in its way.

Both springs and ratchets are made up of small units that each move just slightly, but collectively produce a powerful movement. Ultimately, Mahadevan and Matsudaira hope to better understand just how these particles create an effect that seems to be so much more than the sum of its parts. Might such an understanding provide an inspiration for ways to power artificial nano-sized devices in the future? "The short answer is absolutely," says Mahadevan. "Biology has had a lot more time to evolve enormous richness in design for different organisms; Hopefully, studying these structures will not only improve our understanding of the biological world, it will also enable us to copy them, take apart their components and re-create them for other purposes.

1. According to the author, research on the power source of movement in cells can contribute to

(1) control over the movement of genes within human systems.
(2) the understanding of nanotechnology.
(3) arresting the growth of cancer in a human being.
(4) the development of cures for a variety of diseases.

2. The author has used several analogies to illustrate his arguments in the article. Which of the following pair of words are examples of the analogies used?

a. Cell activity and vehicular traffic.
b. Polymers and tram tracks.
c. Genes and canoes.
d. Vorticellids and ratchets.

(1) a and b (2) b and c
(3) a and d (4) a and c

3. Read the five statements below a, b, c, d and e. From the options given, select the one which includes the statement that is not representative of an argument presented in the passage.

a. Sperms use spring like engines made of actin filament.
b. Myosin and kinesin are unrelated.
c. Nanotechnology researchers look for ways to power molecule-sized devices.
d. Motor proteins help muscle contraction.
e. The dynein motor is still poorly understood.

(1) a, b and c (2) c, d and e
(3) a, d and e (4) a, c and d

4. Read the four statements below a, b, c and d. From the options given, select the one which includes all statement(s) that are representative of arguments presented in the passage.

a. Protein motors help growth processes.
b. Improved transport in nerve cells will help arrest tuberculosis and cancer.
c. Cells, together, generate more power than the sum of power generated by them separately.
d. Vorticellid and the leaf fragment are connected by a calcium engine.

(1) a and b but not c
(2) a and c but not d
(3) a and d but not b
(4) c and d but not b

5. Read the four statements below a, b, c and d. From the options given, select the one which include statement(s) that are representative of arguments presented in the passage.

a. Myosin, kinesin and actin are three types of protein.
b. Growth processes involve a routine in a cell that duplicates their machinery and pulls the copies apart.
c. Myosin molecules can generate vibrations in muscles.
d. Ronald and Mahadevan are researchers at Massachusetts Institute of Technology.

(1) a and b but not c and d
(2) b and c but not a
(3) b and d but not a and c
(4) a, b and c but not d

Instructions for questions 6 - 11:
The passage given below is followed by questions. Choose the best answer for each question.

There are a seemingly endless variety of laws, restrictions, customs and traditions that affect the practice of abortion around the world. Globally, abortion is probably the single most controversial issue in the whole area of women's rights and family matters. It is an issue that inflames women's right groups, religious institutions, and the self-proclaimed "guardians" of public morality. The growing worldwide belief is that the right to control one's fertility is a basic human right. This has resulted in a worldwide trend towards liberalization of abortion laws. Forty percent of the world's population live in countries where induced abortion is permitted on request. An additional 25 percent live in countries where it is allowed if the women's life would be endangered if she were to go ahead with her pregnancy. The estimate is that between 26 and 31 million legal abortions were performed in 1987. However, there were also between 10 and 22 million illegal abortions performed in that year.

Feminists have viewed the patriarchal control of women's bodies as one of the prime issues facing the contemporary women's movement. They observe that the definition and control of women's reproductive freedom have always been the province of men. Patriarchal religion, as manifest in Islamic fundamentalism, traditionalist Hindu practice, orthodox Judaism, and Roman Catholicism, has been an important historical contributory factor for this and continues to be an important presence in contemporary societies.
In recent times, governments, usually controlled by men, have "given" women the right to contraceptive use and abortion access, when their countries were perceived to have an overpopulation problem. When these countries are perceived to be under populated, that right has been absent. Until the nineteenth century, a woman's rights to an abortion followed English common law; it could only be legally challenged if there was a "quickening", when the first movements of the foetus could be felt. In 1800, drugs to induce abortions were widely advertised in local newspapers. By 1900, abortion was banned in every state except to save the life of the mother. The change was strongly influenced by the medical profession, which focused its campaign ostensibly on health and safety issues for pregnant women and the sanctity of life. Its position was also a means of control of non-licensed medical practitioners such as midwives and women healers who practiced abortion.

The anti-abortion campaign was also influenced by political considerations. The large influx of eastern and southern European immigrants with their large families was seen as a threat to the population balance of the future United States. Middle and Upper class Protestants were advocates of abortion as a form of birth control. By supporting abortion prohibitions the hope was that these Americans would have more children and thus prevent the tide of immigrant babies from overwhelming the demographic characteristics of Protestant America. The anti-abortion legislative position remained in effect in the United States through the first sixty-five years of the twentieth century. In the early 1960s, even when it was widely known that the drug thalidomide taken during pregnancy to alleviate anxiety was shown to contribute to the formation of deformed "flipper-like" hands or legs of children, abortion was illegal in the United States. A second health tragedy was the severe outbreak of rubet

during the same time period, which also resulted in major birth defects. These tragedies combined with a change of attitude towards a woman's right to privacy lead a number of states to pass abortion-permitting legislation.

On one side of the controversy are those who call themselves "pro-life". They view the foetus as a human life rather than as an unformed complex of cells; therefore, they hold to the belief that abortion is essentially murder of an unborn child. These groups cite both legal and religious reasons for their opposition to abortion. Pro-life!! point to the rise in legalized abortion figures and see this as morally intolerable. On the other side of the issue all those who call themselves "pro-choice", they believe that women, not legislators or judges, should have the right to decide whether and under what circumstances they will bear children. Pro-choicers are of the opinion that law will not prevent women from having abortions and cite the horror stories of the past when many women died in the hands of "backroom" abortionists and in desperate attempts to self-abort. They also observe that legalizing abortion is especially important for rape victims and incest victims who became pregnant. They stress physical and mental health reasons why women should not have unwanted children.

To get a better understanding of the current abortion controversy, let us examine a very important work by Krist Luker titled Abortion and the Politics of Motherhood. Luker argues that female pro-choice and pro-life activists hold different world views regarding gender, sex, and the meaning of parenthood. Moral positions on abortion are seen to be tied intimately to views on sexual behaviour, the care of children, family life, technology, and the importance of the individual. Luker identifies "pro-choice" women, as educated, affluent, and liberal. The contrasting counterparts, "pro-life" women, support traditional concepts of women as wives and mothers. It would be instructive to sketch out the differences in the world views of these two sets of women. Luker examines California, with its liberalized abortion law, as a case history. Public documents and newspaper accounts over a twenty-year period were analyzed and over 200 interviews were held with both pro-life and pro-choice activists.

Luker found that pro-life and pro-choice activists have intrinsically different views with respect to gender. Pro-life women have a notion of public and private life. The proper place for men is in the public sphere of work; for women, it is the private sphere of the home. Men benefit through the nurturance of women; women benefit through the protection of men. Children are seen to be the ultimate beneficiaries of this arrangement by having the mother as a full-time loving parent and by having clear role models. "Pro-choice" advocates reject the view of separate spheres. They object to the notion of the home being the "women's sphere". Women's reproductive and family roles are seen as potential barriers to full equality. Motherhood is seen as a voluntary, not a mandatory or "natural" role.

In summarizing her findings, Luker believes that women become activists in either of the two movements as the end result of lives that center around different conceptualizations of motherhood. Their beliefs and values are rooted to the concrete circumstances of their lives, their educations, incomes, occupations, and the different marital and family choices that they have made. They represent two different world views of women's roles in contemporary society and as such the abortion issues represents the battleground for the justification of the respective views.

6. According to your understanding of the author's arguments which countries are more likely to allow abortion?

(1) India and China.
(2) Australia and Mongolia.
(3) Cannot be inferred from the passage.
(4) Both (1) and (2).

7. Which amongst these was not a reason for banning of abortions by 1900?

(1) Medical professionals stressing the health and safety of women.
(2) Influx of eastern and southern European immigrants.

(3) Control of unlicensed medical practitioners.
(4) A tradition of matriarchal control.

8. A pro-life woman would advocate abortion if

(1) the mother of an unborn child is suicidal.
(2) bearing a child conflicts with a woman's career prospects.
(3) the mother becomes pregnant accidentally.
(4) none of the above.

9. Pro-choice women object to the notion of the home being the "women's sphere" because they believe

(1) that the home is a "joint sphere" shared between men and women.
(2) that reproduction is a matter of choice for women.
(3) that men and women are equal.
(4) both (2) and (3).

10. Two health tragedies affecting U.S. society in the 1960s led to

(1) a change in attitude to women's right to privacy.
(2) retaining the anti-abortion laws with some exceptions.
(3) scrapping of anti-abortion laws.
(4) strengthening of the pro-life lobby.

11. Historically, the pro-choice movement has got support from, among others

(1) major patriarchal religions.
(2) countries with low population density.
(3) medical profession.
(4) None of the above.

Instructions for questions 12 - 16:
The passage given below is followed by questions. Choose the best answer for each question.

The production of histories of India has become very frequent in recent years and may well call for some explanation. Why so many and why this one in particular? The reason is a twofold one: changes in the Indian scene requiring a re-interpretation of the facts and changes in attitudes of historians about the essential elements of Indian history. These two considerations are in addition to the normal fact of fresh information, whether in the form of archeological discoveries throwing fresh light on an obscure period or culture, or the revelations caused by the opening of archives or the release of private papers. The changes in the Indian scene are too obvious to need emphasis. Only two generations ago British rule seemed to most Indian as well as British observers likely to extend into an indefinite future. Now there is a teenage generation which knows nothing of it. Changes in the attitudes of historians have occurred everywhere, changes in attitudes to the content of the subject as well as to particular countries, but in India there have been some special features. Prior to the British, Indian historiographers were mostly Muslims, who relied, as in the case of Sayyid Chulam Hussain, on their own recollection of events and on information from friends and men of affairs. Only a few like Abdul Fazl had access to official papers. These were personal narratives of events, varying in value with the nature of the writer. The early British writers were officials. In the eighteenth century they were concerned with some aspect of Company policy, or, like Robert Orme in his Military Transactions, gave a straight narrative in what was essentially a continuation of the Muslim tradition. In the early nineteenth century the writers were still, with two notable exceptions, officials, but they were now engaged in chronicling, in varying moods of zest, pride, and awe, the rise of the British power in India to supremacy. The two exceptions were James Mill, with his critical attitude to the Company and John Marchman, the Baptist missionary. But they, like the officials, were Anglo-centric in their attitude, so that the history of modern India in their hands came to be the history of the rise of the British in India.

The official school dominated the writing of Indian history until we get the first professional historian's approach Ramsay Muir and P.E. Roberts in England and H.H. Dodwell in India. Then Indian historians trained in the English school joined in, of whom the most distinguished was Sir Jadunath Sarkar and the other notable writers Surendranath Sen, Dr.

Radhakumud Mukerji, and professor Nilakanta Sastri. They it may be said, restored India to Indian history, but their bias was mainly political. Finally have come the nationalists who range from those who can find nothing good or true in the British to sophisticated historical philosophers like K.M. Panikker.

Along with types of historians with their varying bias have gone changes in the attitude to the content of Indian history. Here Indian historians have been influenced both by their local situation and by changes of thought elsewhere. It is in this field that this work can claim some attention since it seeks to break new ground, or perhaps it deepens a freshly turned furrow in the field of Indian history. The early official historians were content with the glamour and drama of political history from Plassey to the Mutiny, from Duplex to the Sikhs. But when the Raj was settled down, glamour departed from politics, and they turned to the less glorious but more solid ground of administration. Not how India was conquered but how it was governed was the theme of this school of historians. It found its archpriest in H.H. Dodwell, its priestess in Dame Lilian Penson, and its chief shrine in the Volume V of the Cambridge History of India. Meanwhile in Britain other currents were moving, which led historical study into the economic and social fields. R.C. Dutt entered the first of these currents with his Economic History of India to be followed more recently by the whole group of Indian economic historians. W.E. Moreland extended these studies to the Mughal Period. Social history is now being increasingly studied and there is also of course school of nationalist historians who see modern Indian history in terms of the rise and the fulfillment of the national movement.

All these approaches have value, but all share in the quality of being compartmental. It is enough to remove political history from its pedestal of being the only kind of history worth having if it is merely to put other types of history in its place. Too exclusive an attention to economic, social, or administrative history can be as sterile and misleading as too much concentration on politics. A whole subject needs a whole treatment for understanding. A historian must dissect his subject into its elements and then fuse them together again into an integrated whole. The true history of a country must contain all the features just cited but must present them as parts of a single consistent theme.

12. Which of the following may be the closest in meaning to the statement "restored India to Indian history"?

(1) Indian historians began writing Indian history.
(2) Trained historians began writing Indian history.
(3) Writing India-centric Indian history began.
(4) Indian history began to be written in India.

13. Which of the following is the closest implication of the statement "to break new ground, or perhaps to deepen a freshly turned furrow"?

(1) Dig afresh or dig deeper.
(2) Start a new stream of thought or help establish a recently emerged perspective.
(3) Begin or conduct further work on existing archeological sites to unearth new evidence.
(4) Begin writing a history free of any biases.

14. Historians moved from writing political history to writing administrative history because

(1) attitudes of the historian changed.
(2) the Raj was settled down.
(3) politics did not retain its past glamour.
(4) administrative history was based on solid ground.

15. According to the author, which of the following is not among the attitudes of Indian historian of India origin?

(1) Writing history as personal narratives.
(2) Writing history with political bias.
(3) Writing non-political due to lack of glamour.
(4) Writing history by dissecting elements and integrating them again.

16. In the table given below, match the historians to the approaches taken by them

A	Administrative	E	Robert Orme
B	Political	F	H. H. Dodwell
C	Narrative	G	Radha Kumud
D	Economic	H	R. C. dutt

(1) A-F, B-G, C-E, D-H
(2) A-G, B-F, C-E, D-H
(3) A-E, B-F, C-G, D-H
(4) A-F, B-H, C-E, D-G

Instructions for questions 17 - 21:
The passage given below is followed by questions. Choose the best answer for each question.

If translated into English, most of the ways economists talk among themselves would sound plausible enough to poets, journalists, businesspeople, and other thoughtful though non economical folk. Like serious talk anywhere-among boat designers and baseball fans, say -the talk is hard to follow when one has not made a habit of listening to it for a while. The culture of the conversation makes the words arcane. But the people in the unfamiliar conversation are not Martians. Underneath it all (the economist's favorite phrase) conversational habits are similar. Economics uses mathematical models and statistical tests and market arguments, all of which look alien to the literary eye. But looked at closely they are not so alien. They may be seen as figures of speech- metaphors, analogies, and appeals to authority.

Figures of speech are not mere frills. They think for us. Someone who thinks of a market as an "invisible hand" and the organization of work as a "production function" and his coefficients as being "significant," as an economist does is giving the language a lot of responsibility. It seems a good idea to look hard at his language.

If the economic conversation were found to depend a lot on its verbal forms, this would not mean that economics would be not a science, or just a matter of opinion, or some sort of confidence game. Good poets, though not scientists, are serious thinkers about symbols; good historians, though not scientists, are serious thinkers about data. Good scientists also use language. What is more (though it remains to be shown) they use the cunning of language, without particularly meaning to. The language used is a social object, and using language is a social act. It requires cunning (or, if you prefer, consideration), attention to the other minds present when one speaks.

The paying of attention to one's audience is called "rhetoric," a word that I later exercise hard. One uses rhetoric, of course, to warn of a fire in a theatre or to arouse the xenophobia of the electorate. This sort of yelling is the vulgar meaning of the word, like the president's "heated rhetoric" in a press conference or the "mere rhetoric" to which our enemies stoop. Since the Greek flame was lit, though, the word has been used also in a broader and more amiable sense, to mean the study of all the ways of accomplishing things with language inciting a mob to lynch the accused, to be sure, but also persuading readers of a novel that its characters breathe, or bringing scholars to accept the better argument and reject the worse.

The question is whether the scholar- who usually fancies himself an announcer of "results" or a stater of "conclusions" free of rhetoric -speaks rhetorically. Does he try to persuade? It would seem so. Language, I just said, is not a solitary accomplishment. The scholar doesn't speak into the void, or to himself. He speaks to a community of voices. He desires to be heeded, praised, published, imitated, honored, en-nobeled. These are the desires. The devices of language are the means.

Rhetoric is the proportioning of means to desires in speech. Rhetoric is an economics of language, the study of how scarce means are allocated to the insatiable desires of people to be heard. It seems on the face of it, a reasonable hypothesis that economists are like other people in being talkers, who desire listeners that they go to the library or the laboratory as much as when they go to the office on the polls. The purpose here is to see if this is true, and to see if it is useful to study the rhetoric of economic scholarship.

The subject is scholarship. It is not the economy, or the adequacy of economic theory as a description of the economy, or even mainly the economist's role in the economy. The subject is the conversation economists have among themselves, for purposes of persuading each other that the interest elasticity of demand for investment is zero or that the money supply is controlled by the Federal Reserve.

Unfortunately, though, the conclusions are of more than academic interest. The conversations of classicists or of astronomers rarely affect the lives of other people. Those of economists do so on a large scale. A well known joke describes a May Day parade through Red Square with the usual mass of soldiers, guided missiles, rocket launchers. At last come rank upon rank of people in gray business suits. A bystander asks, "Who are those?" "Aha!" comes the reply, "those are economists: you have no idea what damage they can do!" Their conversations do it.

17. According to the passage, which of the following is the best set of reasons for which one needs to "look hard" at an economist's language?

a. Economists accomplish a great deal through their language.
b. Economics is an opinion-based subject.
c. Economics has a great impact on other's lives.
d. Economics damaging.

(1) a and b (2) c and d
(3) a and c (4) b and d

18. In the light of the definition of rhetoric given in the passage, which of the following will have the least element of rhetoric?

(1) An election speech.
(2) An advertisement jingle.
(3) Dialogues of a play.
(4) Commands given by army officers.

19. As used in the passage, which of the following is the closest meaning to the statement "The culture of the conversation makes the words arcane"?

(1) Economists belong to a different culture.
(2) Only mathematicians can understand economists.
(3) Economists tend to use terms unfamiliar to the lay person, but depend on familiar linguistic forms.
(4) Economists use similes and adjectives in their analysis.

20. As used in the passage, which of the following is the closest alternative to the word "arcane"

(1) Mysterious (2) Secret
(3) Covert (4) Perfidious

21. Based on your understanding of the passage, which of the following conclusions would you agree with

(1) The geocentric and the heliocentric views of the solar system are equally tenable.
(2) The heliocentric view is superior because of better rhetoric.
(3) Both views use rhetoric to persuade.
(4) Scientists should not use rhetoric.

Instructions for questions 22 - 25:
The passage given below is followed by questions. Choose the best answer for each question.

The conceptions of life and the world which we call 'philosophical' are a product of two factors: one, inherited religious and ethical conceptions; the other, the sort of investigation which may be called 'scientific', using this word in its broadest sense. Individual philosophers have differed widely in regard to the proportions in which these two factors entered into their systems, but it is the presence of both, in some degree, that characterizes philosophy.
Philosophy' is a word which has been used in many ways, some wider, some narrower. I propose to use it in a very wide sense, which I will now try to explain.

Philosophy, as I shall understand the word, is something intermediate between theology and science. Like theology, it consists of speculations on matters as to which definite knowledge has, so far, been unascertainable; but like science, it appeals to human reason rather than to authority, whether that of tradition or that of revelation. All definite knowledge- so I should contend- belongs to science;

all dogma as to what surpasses definite knowledge belongs to theology. But between theology and science there is a 'No man's Land', exposed to attack from both sides; this 'No Man's Land' is philosophy. Almost all the questions of most interest to speculative minds are such as science cannot answer, and the confident answers of theologians no longer seem so convincing as they did in former centuries. Is the world divided into mind and matter, and if so, what is mind and what is matter? Is mind subject to matter, or is it possessed of independent powers? Has the universe any unity or purpose? Is it evolving towards some goal? Are there really laws of nature, or do we believe in them only because of our innate love of power? Is man what he seems to the astronomer, a tiny lump of carbon and water impotently crawling on a small and unimportant planet? Or is he what he appears to Hamlet? Is he perhaps both at once? Is there a way of living that is noble and another that is base, or are all ways of living merely futile? If there is a way of living that is noble, in what does it consist, and how shall we achieve it? Must the good be eternal in order to deserve to be valued, or is it worth seeking even if the universe is inexorably moving towards death? Is there such a thing as wisdom, or is what seems such merely the ultimate refinement of folly? To such questions no answer can be found in the laboratory. Theologies have professed to give answers, all too definite; but their definiteness causes "modern minds to view them with suspicion. The studying of these questions, if not the answering of them, is the business of philosophy.

Why, then, you may ask, waste time on such insoluble problems? To this one may answer as a historian, or as an individual facing the terror of cosmic loneliness.

The answer of the historian, in so far as I am capable of giving it, will appear in the course of this work. Ever since men became capable of free speculation, their actions in innumerable important respects, have depended upon their theories as to the world and human life, as to what is good and what is evil. This is as true in the present day as at any former time. To understand an age or a nation, we must understand its philosophy, and to understand its philosophy we must ourselves be in some degree philosophers. There is here a reciprocal causation: the circumstances of men's lives do much to determine their philosophy, but, conversely, their philosophy does much to determine their circumstances.

There is also, however, a more personal answer. Science tells us what we can know, but what we can know is little, and if we forget how much we cannot know we may become insensitive to many things of very great importance. Theology, on the other band, induces a dogmatic belief that we have knowledge, where in fact we have ignorance, and by doing so generates a kind of impertinent insolence towards the universe. Uncertainty, in the presence of vivid hopes and fears, is painful, but must be endured if we wish to live without the support of comforting fairy tales. It is not good either to forget the questions that philosophy asks, or to persuade ourselves that we have found indubitable answers to them. To teach how to live without certainty, and yet without being paralyzed by hesitation, is perhaps the chief thing that philosophy, in our age, can still do for those who study it.

22. The purpose of philosophy is to

(1) reduce uncertainty and chaos.
(2) help us to cope with uncertainty and ambiguity.
(3) help us to find explanations for uncertainty.
(4) reduce the terror of cosmic loneliness.

23. Based on this passage what can be concluded about the relation between philosophy and science?

(1) The two are antagonistic.
(2) The two are complementary.
(3) There is no relation between the two.
(4) Philosophy derives from science.

24. From reading the passage, what can be concluded about the profession of the author? He is most likely not to be a

(1) historian (2) philosopher
(3) scientist (4) theologian

25. According to the author, which of the following statements about the nature of the universe must be definitely true

(1) The universe has unity.
(2) The universe has a purpose.
(3) The universe is evolving towards a goal.
(4) None of the above.

Instructions for questions 26 - 28:
Fill the gaps in the passage below with the most appropriate word from the options given for each gap. The right words are the ones used by the author. Be guided by the author's overall style and meaning when you choose the answers.

Von Neumann and Morgenstern assume a decision framework in which all options are thoroughly considered, each option being independent of the others, with a numerical value derived for the utility of each possible outcome (these outcomes reflecting, in turn, all possible combinations of choices). The decision is then made to maximize the expected utility.
_____ such a model reflects major simplifications of the way decisions are made in the real world. Humans are not to process information as quickly and effectively as the model assumes; they tend not to think _____ as easily as the model calls for; they often deal with a particular option without really assessing its _____ and when they do assess alternatives, they may be externally nebulous about their criteria of evaluation.

26.
(1) Regrettably (2) Firstly
(3) Obviously (4) Apparently

27.
(1) quantitatively (2) systematically
(3) scientifically (4) analytically

28.
(1) implications (2) disadvantages
(3) utility (4) alternatives

Instructions for questions 29 – 31:
Fill the gaps in the passage below with the most appropriate word from the options given for each gap. The right words are the ones used by the author. Be guided by the author's overall style and meaning when you choose the answers.

In a large company, _____ people is about as common as using a gun or a switch-blade to _____ an argument. As a result, most managers have little or no experience of firing people, and they find it emotionally automatic, as result, they often delay the act interminably, much as an unhappy spouse will prolong a bad marriage. And when the firing is done, it's often done clumsily, with far worse side effects than are necessary.

Do the world-class software organizations have a different way of firing people? No. But they do the deed swiftly, humanely, and professionally.
The key point here is to view the fired employee as a "failed product" and to ask how the process _____ such a phenomenon in the first place.

29.
(1) dismissing (2) punishing
(3) firing (4) admonishing

30.
(1) resolve (2) thwart
(3) defeat (4) close

31.
(1) derived (2) engineered
(3) produced (4) allowed

Instructions for questions 32 - 35:
In each of the questions given below, four different ways of writing a sentence are indicated. Choose the best way of writing the sentence.

32.
A. The main problem with the notion of price discrimination is that it is not always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.
B. The main problem with the notion of price discrimination is not that it is always a bad

thing, it is the monopolist who has the power to decide who is charged what price.

C. The main problem with the notion of price discrimination is not that it is always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.

D. The main problem with the notion of price discrimination is not it is always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.

(1) A (2) B
(3) C (4) D

33.

A. A symbiotic relationship develops among the contractors, bureaucracy and the politicians, and by a large number of device, costs are artificially escalated and black money is generated by underhand deals.

B. A symbiotic relationship develops among contractors, bureaucracy and politicians, and costs are artificially escalated with a large number of devices and black money is generated through underhand deals.

C. A symbiotic relationship develops among contractors, bureaucracy and the politicians, and by a large number of devices costs are artificially escalated and black money is generated on underhand deals.

D. A symbiotic relationship develops among the contractors, bureaucracy and politicians, and by large number of devices costs are artificially escalated and black money is generated by underhand deals.

(1) A (2) B
(3) C (4) D

34.

A. The distinctive feature of tariffs and export subsidies is that they create difference of prices at which goods are traded on the world market and their price within a local market.

B. The distinctive feature of tariffs and export subsidies is that they create a difference of prices at which goods are traded with the world market and their prices in the local market.

C. The distinctive feature of tariffs and export subsidies is that they create a difference between prices at which goods are traded on the world market and their prices within a local market.

D. The distinctive feature of tariffs and export subsidies that they create a difference across prices at which goods are traded with the world market and their prices within a local market.

(1) A (2) B
(3) C (4) D

35.

A. Any action of government to reduce the systemic risk inherent in financial markets will also reduce the risks that private operators perceive and thereby encourage excessive hedging.

B. Any action by government to reduce the systemic risk inherent in financial markets will also reduce the risks that private operators perceive and thereby encourage excessive gambling.

C. Any action by government to reduce the systemic risk inherent due to financial markets will also reduce that risks that private operators perceive and thereby encourages excessive hedging.

D. Any action of government to reduce the systemic risk inherent to financial markets will also reduce the risks that private operators perceive and thereby encourage excessive gambling.

(1) A (2) B
(3) C (4) D

Instructions for questions 36 - 40:
The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the four given choices to construct a coherent paragraph.

36.

A. Branded disposable diapers are available at many supermarkets and drug stores.
B. If one supermarket sets a higher price for a diaper, customers may buy that brand elsewhere.
C. By contrast, the demand for private-label products may be less price sensitive since it is available only at our corresponding supermarket chain.
D. So, the demand for branded diapers at any particular store may be quite price sensitive. For instance, only SavOn Drugs stores sell SavOn Drugs diapers.
E. Then, stores should set a higher incremental margin percentage for private-label diapers.

(1) ABCDEF (2) ABCEDF
(3) ADBCEF (4) AEDBCF

37.

A. Having a strategy is a matter of discipline.
B. It involves the configuration of a tailored value chain that enables a company to offer unique value.
C. It requires a strong focus on profitability and a willingness to make tough trade-offs in choosing what not to do.
D. Strategy goes far beyond the pursuit of best practices.
E. A company must stay the course even during times of upheaval, while constantly improving and extending its distinctive positioning.
F. When a company's activities fit together as a self-reinforcing system, any competitor wishing to imitate a strategy must replicate the whole system.

(1) ACEDBF (2) ACBDEF
(3) DCBEFA (4) ABCEDF

38.

A. As officials, their vision of a country shouldn't run too far beyond that of the local people with whom they have to deal.
B. Ambassadors have to choose their words.
C. To say what they feel they have to say, they appear to be denying or ignoring part of what they know.
D. So, with ambassadors as with other expatriates in black Africa, there appears at a first meeting a kind of ambivalence.
E. They do a specialized job and it is necessary for them to live ceremonial lives.

(1) BCEDA (2) BEDAC
(3) BEADC (4) BCDEA

39.

A. "This face off will continue for several months given the strong convictions on either side," says a senior functionary of the high-powered task force on drought.
B. During the past week-and-half, the Central Government has sought to deny some of the earlier apprehensions over the impact of drought.
C. The recent revival of the rains had led to the emergence of a line of divide between the two.
D. The state governments, on the other hand allege that the Centre is downplaying the crisis only to evade its full responsibility of financial assistance that is required to alleviate the damage.
E. Shrill alarm about the economic impact of an inadequate monsoon had been sounded by the Centre as well as most of the states, in late July and early August.

(1) EBCDA (2) DBACE
(3) BDCAE (4) ECBDA

40.

A. This fact was established in the 1730s by French survey expeditions to the Equator and to Lapland in the Arctic, which found that around the middle of the earth the arc was about a kilometer shorter.
B. One of the unsettled scientific questions in the late 18th century was the exact nature of the shape of the earth.
C. The length of one-degree arc would be less near the equatorial latitudes than at the poles.
D. One way of doing that is to determine the length of the arc along a chosen longitude or meridian at one degree latitude separation.
E. While it was generally known that the earth was not a sphere but an 'oblate spheroid' more curved at the equator and flatter at the poles, the question of 'how much more' was yet to be established.

(1) BECAD
(2) BEDCA
(3) BDACE
(4) EBDCA

Instructions for questions 41 - 45:
For the word given at the top of each table, match the dictionary definitions on the left (A, B, C, D) with their corresponding usage on the right (E, F, G, H). Out of the four possibilities given in the boxes below the table, select the one that has all the definitions and their usages most closely matched.

41. MEASURE

	Dictionary Definition		Usage
A.	Size of quality found by measuring	E.	A measure was instituted to prevent outsiders from entering the campus.
B.	Vessel of standard capacity	F.	Sheila was asked to measure each item that was delivered.
C.	Suitable action	G.	The measure of the cricket pitch was 22 yards.
D.	Ascertain extent or quality	H.	Ratnesh used a measure to take out one litre of oil.

(1) A-F, B-G, C-E, D-H
(2) A-G, B-F, C-E, D-H
(3) A-G, B-H, C-E, D-G
(4) A-E, B-F, C-G, D-H

42. BOUND

Dictionary Definition		Usage	
A.	Obliged, constrained	E.	Dinesh felt bound to walk out when the discussion turned to kickbacks.
B.	Limiting, value	F.	Bulleted by contradictory forces he was bound to lose his mind.
C.	Move in a specified direction	G.	Vidya's story strains the bounds of credulity.
D.	Destined or certain to be	H.	Bound for a career in law, Jyoti was reluctant to study Milton.

(1) A-F, B-G, C-E, D-H
(2) A-E, B-G, C-H, D-F
(3) A-E, B-F, C-G, D-H
(4) A-F, B-H, C-E, D-G

43. CATCH

Dictionary Definition		Usage	
A.	Capture	E.	All her friends agreed that Prasad was a good catch.
B.	Grasp with senses or mind	F.	The proposal sounds very good but where is the catch.
C.	Deception	G.	Hussain tries to catch the spirit of India in his painting.
D.	Thing or person worth trapping	H.	Sorry, I couldn't catch you.

(1) A-F, B-G, C-E, D-H
(2) A-G, B-F, C-E, D-H
(3) A-E, B-F, C-G, D-H
(4) A-G, B-H, C-F, D-E

44. DEAL

Dictionary Definition		Usage	
A.	Manage, attend to	E.	Dinesh insisted on dealing the cards.
B.	Stock, sell	F.	This contract deals with handmade cards.
C.	Give out to a number of people	G.	My brother deals in cards.
D.	Be concerned with	H.	I decided not to deal with handmade cards.

(1) A-F, B-G, C-E, D-H (2) A-H, B-G, C-E, D-F
(3) A-E, B-F, C-G, D-H (4) A-F, B-H, C-E, D-G

45. TURN

Dictionary Definition		Usage	
A.	Change of form	E.	The much hyped concert turned out to be a damp squib.
B.	Change orientation or direction	F.	The apprehended criminal was turned in to the cops.
C.	To send or let go	G.	The new school building has been turned into a museum.
D.	Outcome	H.	Vikas turned his face from right to left.

(1) A-F, B-G, C-E, D-H (2) A-G, B-H, C-F, D-E
(3) A-E, B-F, C-G, D-H (4) A-F, B-H, C-E, D-G

Instructions for questions 46 - 50:
For every word a sentence is given, you have to find out the option which represents the similar meaning to the given word

46. OPPROBRIUM - The police had to bear the opprobrium generated by their blatant partisan conduct.

(1) Harsh criticism (2) Acute distrust
(3) Bitter enmity (4) Stark oppressiveness

47. PORTENDS - It appears to many that US "war on terrorism" portends trouble in Gulf.

(1) Introduces (2) Bodes (3) Spells (4) Evokes

48. PREVARICATE - When her video tape recording was shown to her and asked to explain her presence, she started prevaricating.

(1) Speaking evasively (2) Speaking violently
(3) Lying furiously (4) Throwing a tantrum

49. RESTIVE - The waiting public started getting restive when the leader got late for the speech

(1) Angry (2) Violent (3) Restless (4) Distressed

50. OSTENSIBLE - The watchmen's ostensible job is to guard this building.

(1) Blatant (2) Ostentatious (3) Insidious (4) Apparent

Section II

51. On dividing a number by 3, 4 and 7, the remainders are 2, 1 and 4 respectively. If the same number is divided by 84 then the remainder is

(1) 80 (2) 76
(3) 53 (4) None of these

52. There are three pieces of cake weighing 9/2 lbs, 27/4 lbs and 36/5 lbs. Pieces of the cake are equally divided and distributed in such a manner that every guest in the party gets one single piece of cake. Further the weight of the pieces of the cake is as heavy as possible. What is the largest number of guests to whom we can distribute the cake?

(1) 54 (2) 72
(3) 20 (4) None of these

53. For three integers x, y and z, $x + y + z = 5$, and $xy + yz + xz = 3$. What is the largest value which x can take?

(1) $3\sqrt{13}$ (2) $\sqrt{19}$
(3) $\frac{13}{3}$ (4) $\sqrt{15}$

54. There are six persons sitting around a round table. Pankaj is sitting left of Dayanand who is facing Kundan. Ranjan is sitting right of Dayanand. Yash is sitting left of Pankaj and Abhishek is sitting right of Ranjan. If Pankaj and Ranjan swap their positions and Yash and Abhishek also swap their positions, then who will be to the left of Abhishek?

(1) Kundan (2) Yash
(3) Dayanand (4) Pankaj

55. A transport company charges for its vehicles in the following manner:
If the driving is 5 hours or less, the company charges Rs. 60 per hour or Rs. 12 per km (which ever is larger)
If driving is more than 5 hours, the company charges Rs. 50 per hour or Rs. 7.5 per km (which ever is larger)
If Anand drove it for 30 km and paid a total of Rs. 300, then for how many hours does he drive?

(1) 4 (2) 5.5
(3) 7 (4) 6

56. Only a single rail track exists between station A and B on a railway line. One hour after the north bound superfast train N leaves station A for station B, a south passenger train S reaches station A from station B. The speed of the superfast train is twice that of a normal express train E, while the speed of a passenger train S is half that of E. On a particular day N leaves for station B from station A, 20 minutes behind the normal schedule. In order to maintain the schedule both N and S increased their speed. If the superfast train doubles its speed, what should be the ratio (approximately) of the speed of passenger train to that of the superfast train so that passenger train S reaches exactly at the scheduled time at the station A on that day?

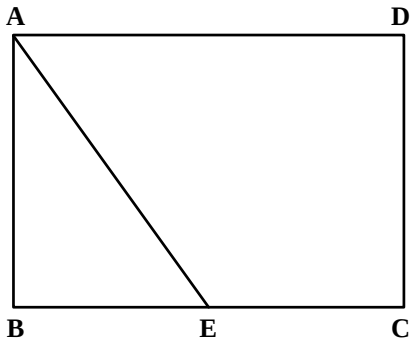
(1) 1 : 3 (2) 1 : 4
(3) 1 : 5 (4) 1 : 6

57. If $x^2 + 5y^2 + z^2 = 2y(2x + z)$, then which of the following statements are necessarily true?

I. $x = 2y$
II. $x = 2z$
III. $2x = z$

(1) Only I (2) Only II
(3) Only III (4) Only I and II

58. In the following figure, the area of the isosceles right triangle ABE is 7 sq.cm. If EC = 3BE, then the area of rectangle ABCD (in sq. cm.) is



(1) 64 (2) 82
(3) 26 (4) 56

59. Number S is equal to the square of the sum of the digits of a 2 digit number D. If the difference between S and D is 27, then D is

(1) 32 (2) 54
(3) 64 (4) 52

60. A boy finds the average of 10 positive integers. Each integer contains two digits. By mistake, the boy interchanges the digits of one number say *ba* for *ab*. Due to this, the average becomes 1.8 less than the previous one. What was the difference of the two digits *a* and *b*?

(1) 4 (2) 2
(3) 6 (4) 8

61. A string of length 40 metres is divided into three parts of different lengths. The first part is three times the second part, and the last part is 23 metres smaller than the first part. Find the length of the largest part.

(1) 27 (2) 4
(3) 5 (4) 9

62. For all integers $n > 0$, $7^{6n} - 6^{6n}$ is divisible by

(1) 13 (2) 127
(3) 559 (4) All of these

63. n_1, n_2, n_3 ... n_{10} are 10 numbers such that $n_1 > 0$ and the numbers are given in ascending order. How many triplets can be formed using these numbers such that in each triplet, the first number is less than the second number, and the second number is less than the third number?

(1) 109 (2) 27
(3) 36 (4) None of these

64. In order to cover less distance, a boy - rather than going along the longer and the shorter lengths of the rectangular path, goes by the diagonal. The boy finds that he saved a distance equal to half the longer side. The ratio of the breadth and length is

(1) 1/2 (2) 2/3
(3) 3/4 (4) 7/15

65. The number of roots of

$$\frac{A^2}{x} + \frac{B^2}{x-1} = 1 \text{ is}$$

(1) 1 (2) 2
(3) 3 (4) Cannot be determined

66. Mayank, Mirza, Little and Jagbir bought a motorbike for \$60. Mayank contributed half of the total amount contributed by others, Mirza contributed one-third of total amount contributed by others, and Little contributed one-fourth of the total amount contributed by others. What was the money paid by Jagbir?

(1) \$12 (2) \$13
(3) \$18 (4) \$20

67. If *U*, *V*, *W* and *m* are natural numbers such that $U^m + V^m = W^m$, then which of the following is true?

(1) $m < \text{Min}(U, V, W)$ (2) $m > \text{Max}(U, V, W)$
(3) $m < \text{Max}(U, V, W)$ (4) None of these

68. If $f(x) = \log\left(\frac{1+x}{1-x}\right)$, then $f(x) + f(y) =$

(1) $f(x + y)$ (2) $f(1 + xy)$

(3) $(x + y)f(1 + xy)$ (4) $f\left(\frac{x+y}{1+xy}\right)$

69. On a straight road XY, 100 metres in length, 5 stones are kept beginning from the end X. The distance between two adjacent stones is 2 metres. A man is asked to collect the stones one at a time and put at the end Y. What is the distance covered by him?

(1) 460 metres (2) 540 meters

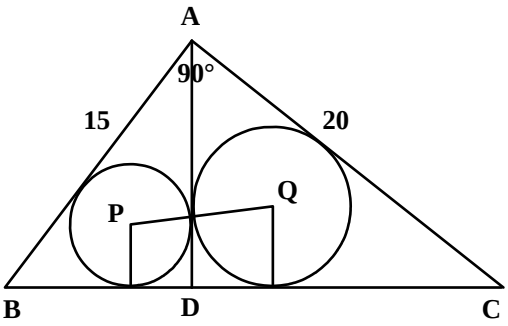
(3) 860 metres (4) 920 metres

70. The internal bisector of an angle A in a triangle ABC meets the side BC at point D. AB = 4, AC = 3 and ∠A = 60°. Then what is the length of the bisector AD?

(1) $\frac{12\sqrt{3}}{7}$ (2) $\frac{12\sqrt{13}}{7}$

(3) $\frac{4\sqrt{13}}{7}$ (4) $\frac{4\sqrt{3}}{7}$

71. In the figure below, ABC is a right-angled triangle. AD is the altitude. Circles are inscribed within the triangles ACD and ABD. P and Q are the centres of the circles. The distance PQ is



(1) 7 m (2) 4.5 m

(3) 10.5 m (4) 6 m

72. The remainder when 2^{256} is divided by 17 is

(1) 7 (2) 13

(3) 11 (4) 1

73. Let $S = 2x + 5x^2 + 9x^3 + 14x^4 + 20x^5$ .... infinity

The coefficient of n^{th} term is $\frac{n\,(n+3)}{2}$.

The sum S is

(1) $\frac{x(2-x)}{(1-x)^3}$ (2) $\frac{(2-x)}{(1-x)^3}$

(3) $\frac{x(2-x)}{(1-x)^2}$ (4) None of these

74. There is a common chord of 2 circles with radius 15 and 20. The distance between the two centres is 25. The length of the chord is

(1) 48 (2) 24

(3) 36 (4) 28

75. A man received a cheque. The amount in Rs. has been transposed for paise and vice versa. After spending Rs. 5 and 42 paise, he discovered he now had exactly 6 times the value of the correct cheque amount. What amount he should have received?

(1) 5.30 (2) 6.44

(3) 60.44 (4) 16.44

76. Suppose, for any real number x, $[x]$ denotes the greatest integer less than or equal to x. Let $L(x, y) = [x] + [y] + [x + y]$ and $R(x, y) = [2x] + [2y]$. Then it's impossible to find any two positive real numbers x and y for which of the following?

(1) $L(x, y) = R(x, y)$ (2) $L(x, y) \neq R(x, y)$

(3) $L(x, y) < R(x, y)$ (4) $L(x, y) > R(x, y)$

77. A student finds the sum 1 + 2 + 3 + ... as his patience runs out. He found the sum as 575. When the teacher declared the result wrong, the student realized that he missed a number. What was the number the student missed?

(1) 16 (2) 18

(3) 14 (4) 20

78. A thief was stealing diamonds from a jewellery store. On his way out, he encountered three guards, each was given half of the existing diamonds and two over it by the thief. In the end, he was left with one diamond. How many did the thief steal?

(1) 40 (2) 36
(3) 42 (4) 38

79. Three friends went for a picnic. First brought five apples and the second brought three. The third friend however brought only Rs. 8. What is the share of the first friend?

(1) 8 (2) 7
(3) 1 (4) None of these

80. Amar went for a holiday to his friend's place. They together either went for yoga in the morning or played tennis in the evening but not both. 14 mornings and 24 evenings, they both stayed home and they both went out together for 22 days. How many days did Amar stay at his friend's place?

(1) 20 (2) 16
(3) 30 (4) 40

81. The area of the triangle with the vertices (a, a), $(a + 1, a)$ and $(a, a + 2)$ is

(1) a^3 (2) 1
(3) 0 (4) None of these

82. On a 20 km tunnel connecting two cities A and B there are three gutters. The distance between gutter 1 and 2 is half the distance between gutter 2 and 3. The distance from city A to its nearest gutter, gutter 1 is equal to the distance of city B from gutter 3. On a particular day the hospital in city A receives information that an accident has happened at the third gutter. The victim can be saved only if an operation is started within 40 minutes. An ambulance started from city A at 30 km/hr and crossed the first gutter after 5 minutes. If the driver had doubled the speed after that, what is the maximum amount of time the doctor would get to attend the patient at the hospital? Assume 1 minute is elapsed for taking the patient into and out of the ambulance.

(1) 4 min
(2) 2.5 min
(3) 1.5 min
(4) Patient died before reaching the hospital

83. Neeraj has a rectangular field of size 20 × 40 sq.m. He has to mow the field with a mowing machine of width 1 m. If he mows the field from the extremes to the centre, then the number of rounds taken by him to mow half of the field will be

(1) 3.5 (2) 3.8
(3) 3 (4) 4

84. On the corners of a square field of side 14 metres, 4 horses are tethered in such a way the adjacent horses just reach each other. There is a circular pond of area 20 sq.m. in the centre of the square. What is the area left ungrazed?

(1) 154 sq.m (2) 22 sq.m
(3) 120 sq.m (4) None of these

85. How many numbers between 0 and one million can be formed using 0, 7 and 8?

(1) 486 (2) 1086
(3) 728 (4) None of these

86. In how many ways, we can choose a black and a white square on a chess board such that the two are not in the same row or column?

(1) 32 (2) 96
(3) 24 (4) None of these

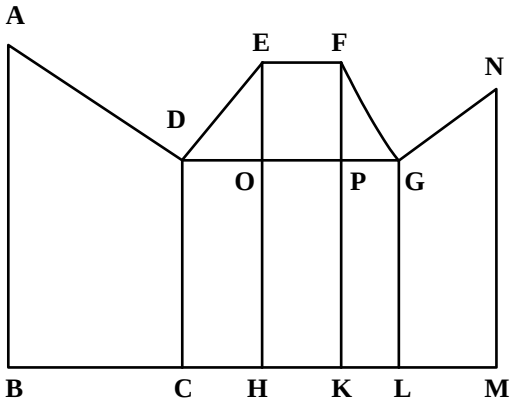
87. A rich merchant had collected many gold coins. He did not want anybody to know about them. One day, his wife asked. "How many gold coins do we have?" After pausing a moment, he replied, "Well! If I divide the coins into two unequal numbers, then 48 times the difference of the numbers is equal to the difference of their squares. The wife looked puzzled. Can you help

the merchant's wife by finding out how many gold coins the merchant has?

(1) 48 (2) 96
(3) 32 (4) 36

Instructions for questions 88 and 89:
Answer the following questions based on the information given below.

In the diagram below, ∠ABC = 90° = ∠DCH = ∠DOE = ∠EHK = ∠FKL = ∠GLM = ∠LMN, AB = BC = 2CH = 2CD = EH = FK = 2HK = 4KL = 2LM = MN



88. The magnitude of ∠FGO =

(1) 30° (2) 45°
(3) 60° (4) None of these

89. The ratio of the areas of the two quadrangles ABCD and DEFG is

(1) 1 : 2 (2) 2 : 1
(3) 12 : 7 (4) None of these

90. If $X_n = (-1)^n X_{n-1}$ and $X_0 = x$, then

(1) X_n is positive for n = even
(2) X_n is negative for n = even
(3) X_n is positive for n = odd
(4) None of these

Instructions for questions 91 and 92:
There are 11 alphabets A, H, I, M, O, T, U, V, W, X, Y. They are called symmetrical alphabets. The remaining alphabets are known as asymmetrical alphabets.

91. How many four-lettered passwords can be formed by using symmetrical letters only? (repetitions not allowed)

(1) 1086 (2) 255
(3) 7920 (4) None of these

92. How many three-lettered words can be formed such that at least one symmetrical letter is there?

(1) 12870 (2) 18330
(3) 16420 (4) None of these

93. It takes 6 technicians a total of 10 hours to build a new server from Direct Computer, with each working at the same rate. If six technicians start to build the server at 11 a.m. and one technician per hour is added beginning at 5 p.m., at what time will the server be complete?

(1) 6:40 p.m. (2) 7:00 p.m.
(3) 7:20 p.m. (4) 8:00 p.m.

94. Davji shop sells samosas in boxes of different sizes. The samosas are priced at Rs. 2 per samosa upto 200 samosas. For every additional 20 samosas, the price of the whole lot goes down by 10 paisa per samosa. What should be the maximum size of the box that would maximize the revenue?

(1) 240 (2) 300
(3) 400 (4) None of these

95. Three small pumps and one large pump are filling a tank. Each of the three small pumps works at $2/3^{rd}$ the rate of the large pump. If all 4 pumps work at the same time, then they should fill the tank in what fraction of time that it would have taken the large pump alone?

(1) $\frac{4}{7}$ (2) $\frac{1}{3}$
(3) $\frac{2}{3}$ (4) $\frac{3}{4}$

96. If $pqr = 1$ then

$$\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$$

is equivalent to

(1) $p+q+r$ (2) $\frac{1}{p+q+r}$

(3) 1 (4) $p^{-1}+q^{-1}+r^{-1}$

97. There is a tunnel connecting city A and B. There is a CAT which is standing at 3/8 the length of the tunnel from A. It listens to the whistle of the train and starts running towards the entrance where, the train and the CAT meet. In another case, the CAT started running towards the exit and the train again met the CAT at the exit. What is the ratio of their speeds?

(1) 4 : 1 (2) 1 : 2
(3) 8 : 1 (4) None of these

98. In a book store, the words of the glowsign board ***"MODERN BOOK STORES"*** are individually flashed after 5/2, 17/4 and 41/8 seconds respectively. Each word is put off after a second. What is the least time after which full name of the book store can be read?

(1) 73.5 seconds (2) 79.4 seconds
(3) 68.2 seconds (4) None of these

Instructions for questions 99 - 100:
A boy is supposed to put a mango into a basket if ordered 1, an orange if ordered 2 and an apple if ordered 3. He took out 1 mango and 1 orange if ordered 4. He was given the following sequence of orders.

12332142314223314113234

99. At the end of the sequence, what will be the number of oranges in the basket?

(1) 2 (2) 3
(3) 4 (4) 6

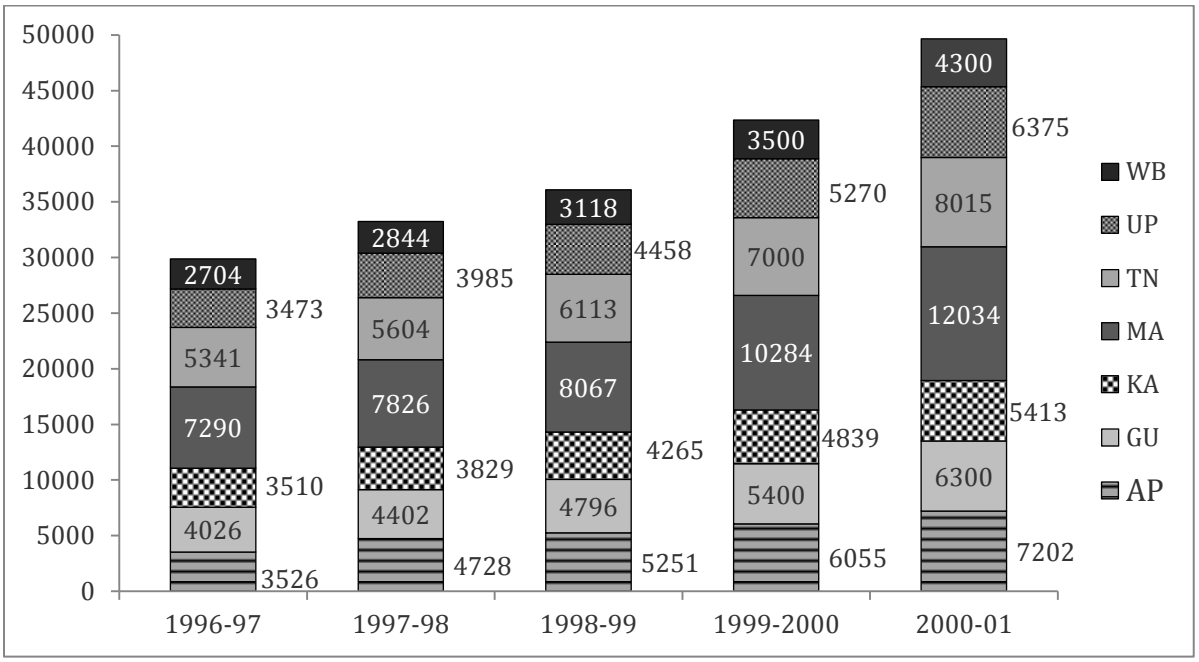
100. At the end of the sequence, what will be the total number of fruits in the basket?

(1) 10 (2) 11
(3) 13 (4) 17

Section III

Answer questions 101 to 106 based on the following information:

The chart given below indicates the annual sales tax revenue collections (in crores of rupees) of seven states from 1996 to 2001.



101. If for each year, the states are ranked in terms of descending order of sales tax collections, then how many states don't change their ranking more than once over the five years?

(1) 1 (2) 5 (3) 3 (4) 4

102. Which of the following states has changed its relative ranking most number of times when you rank the states in terms of the descending volume of sales tax collections each year?

(1) Andhra Pradesh (2) Uttar Pradesh (3) Karnataka (4) Tamil Nadu

103. The percentage share of sales tax revenue of which state has increased from 1997 to 2001?

(1) Tamil Nadu (2) Karnataka (3) Gujarat (4) Andhra Pradesh

104. Which pair of successive years shows the maximum growth rate of tax revenue in Maharashtra?

(1) 1997 to 1998 (2) 1998 to 1999 (3) 1999 to 2000 (4) 2000 to 2001

105. Identify the state whose tax revenue increased exactly by the same amount in two successive pair of years?

(1) Karnataka (2) West Bengal (3) Uttar Pradesh (4) Tamil Nadu

106. Which state below has been maintaining a constant rank over the years in terms of its contribution to the total tax collections?

(1) Andhra Pradesh (2) Karnataka (3) Tamil Nadu (4) Uttar Pradesh

Answer questions 107 to 109 based on the following information:

The table below gives information about four different crops, their different quality categories and the regions where they are cultivated. Based on the information given in the table, answer the questions given below:

Type of Crops	Quality	Region
Crop-1	High	R_1, R_2, R_3, R_4, R_5
	Medium	R_6, R_7, R_8
	Low	R_9, R_{10}, R_{11}
Crop-2	High	R_5, R_8,R_{12}
	Medium	R_9, R_{13}
	Low	R_6
Crop-3	High	R_2, R_6, R_{13}
	Medium	R_3, R_9, R_{11}
	Low	R_1, R_4
Crop-4	High	R_3, R_{10}, R_{11}
	Medium	R_1, R_2, R_4
	Low	R_5, R_9

107. How many regions produce medium quality of Crop-1 or Crop-2 and also produce low quality of Crop-3 or Crop-4?

(1) Zero (2) One (3) Two (4) Three

108. Which of the following statements is true?

(1) All medium quality Crop-2 producing regions are also high quality Crop-3 producing regions.
(2) All high quality Crop-1 producing regions are also medium and low Crop-4 producing regions.
(3) There are exactly five Crop-3 producing regions, which also produce Crop-4 but not Crop-2.
(4) Some Crop-3 producing regions produce Crop-1 and high quality Crop-2.

109. How many low quality Crop-1 producing regions are either high quality Crop-4 producing regions or medium quality Crop-3 producing regions?

(1) One (2) Two (3) Three (4) Four

Answer questions 110 to 112 based on the following information:

Answer these questions based on the table given below.

S. No.	Country	Capitals	Latitude	Longitude
1	Argentina	Buenos Aires	34.30 S	58.20 E
2	Australia	Canberra	35.15 S	149.08 E
3	Austria	Vienna	48.12 N	16.22 E
4	Bulgaria	Sofia	42.45 N	23.20 E
5	Brazil	Brasilia	15.47 S	47.55 E
6	Canada	Ottawa	45.72 N	75.42 E
7	Cambodia	Phnom Penh	11.33 N	104.55 E
8	Equador	Malabo	0.15 S	78.35 E
9	Ghana	Accra	1.35 N	0.6 E
10	Iran	Tehran	35.44 N	51.30 E
11	Ireland	Dublin	53.20 N	6.18 E
12	Libya	Tripoli	32.49 N	13.07E
13	Malaysia	Kuala Lumpur	3.99 N	101.41 E
14	Peru	Lima	12.05 S	77.0 E
15	Poland	Warsaw	52.13 N	21.0 E
16	New Zealand	Wellington	41.17 S	174.47 E
17	Saudi Arabia	Riyadh	24.41 N	46.42 E
18	Spain	Madrid	10.25 N	3.45 W
19	Sri Lanka	Colombo	6.56 N	79.58 E
20	Zambia	Lusaka	15.28 S	28.16 E

110. What percentage of cities located within 10° E and 40° E (10° east and 40° east) lie in the Southern Hemisphere?

(1) 15% (2) 20% (3) 25% (4) 30%

111. The number of cities whose name begin with a consonant and are in the Northern Hemisphere in the table:

(1) exceed the cities whose names begin with a consonant of Southern Hemisphere by 4.
(2) exceed the cities whose names begin with a consonant of Southern Hemisphere by 6.
(3) is less than the number of cities whose name begin with a consonant of east of the meridian by 1.
(4) is less than the number of cities whose name begin with a consonant of east of the meridian by 2.

112. The ratio of the number of countries whose name starts with vowel and located in the Southern Hemisphere, to the number of countries, the name of whose capital cities starts with a vowel in the table above is:

(1) 3 : 2 (2) 3 : 3 (3) 3 : 1 (4) 4 : 3

Answer questions 113 to 116 based on the following information:

The following table shows the earnings of employees in the month of June 2002. They generally worked 25 days in a month.

Employment No.	Total Earning				Total Days			
	Complex	Medium	Simple	Total	Complex	Medium	Simple	Total
2001147	82.98		636.5	719.51	3	0	23	26
2001148	51.53		3	513.26	3.33	1.67	16	21
2001151	171.71		79.1	282.81	5.5	4	8.5	18
2001155	100.47		497.5	517.85	6	4.67	7.33	18
2001159	594.43	159.64		754.06	9.67	13.33	0	23
2001161	83.7			89.7	8	0	1	9
2001162	472.51	109.73		582.04	1.29	9.61	0	11
2001165	402.25	735.72	213.7	1351.1	5.27	12.07	0.67	18
2001167	576.57			576.57	21	0	0	21
2001169	288.48	6.1		292.57	8.38	4.25	0.38	13
2001170	812.1	117.46		629.56	10	8.5	3.5	22
2001171	1203.88			1303.9	28.8	0	0.5	26
2001174	1017.94			1017.9	26	0	0	23
2001177	46.56	726.19		822.75	2	19	0	21
2001180	116.4	1262.79		1379.2	5	19	0	33

113. The number of employees who have earned more than Rs. 50 per day in complex operation is:

(1) 4 (2) 3 (3) 6 (4) 7

114. The number of employees who have earned more than Rs. 600 and having more than 80% attendance (there are 25 regular working days in June 2002; some might be coming on overtime too) is:

(1) 4 (2) 5 (3) 6 (4) 7

115. The employee number of the person (among the following) who has earned the maximum earnings per day in medium operations is:

(1) 2001180 (2) 2001165 (3) 2001170 (4) 2001177

116. Among the employees who were engaged in complex and medium operations, the number of employees whose average earnings per day in complex operations is more than their average earnings per day in medium operations is:

(1) 2 (2) 3 (3) 5 (4) 7

Answer questions 117 to 124 based on the following information:

Following table shows the REPSOL YPF's Operations of oil and gas producing activities.

REPSOL YPF's Operations of oil and gas producing activities										
S.No.	**Item**	**Year**	**Total World**	**Spain**	**North Africa And Middle East**	**Argentina**	**Rest of Latin America**	**Far East**	**Northern Sea**	**Rest of the world**
1	Revenue	1998	916	70	366	281	34	82	78	5
		1999	3374	55	666	2006	115	301	140	31
		2000	5328	394	1290	5539	482	603	0	20
2	Expenses	1998	668	39	255	187	57	63	52	15
		1999	1999	48	325	1168	131	244	65	58
		2000	3709	43	530	2840	252	311	0	33
3	Income before Taxes and Charges (Revenue - Expenses) (2 - 1)	1998	248	31	111	94	-23	19	26	-10
		1999	1375	7	341	838	16	97	75	33
		2000	4619	351	760	2999	230	292	0	-13
4	Taxes and charges	1998	152	6	104	33	-3	9	6	-3
		1999	561	3	169	338	-6	39	24	-3
		2000	1845	126	404	1150	61	103	0	1
5	Net Income after Taxes and charges (3-4)	1998	96	25	7	61	-20	10	24	-7
		1999	814	4	172	5000	-10	58	54	36
		2000	2774	225	356	1849	169	189	0	-14

117. How many operations (Spain, North Africa and Middle East, ...) of the company account for less than 5% of the total revenue earned in the year 1999?

(1) 2 (2) 3 (3) 4 (4) None of these

118. How many operations (Spain, North Africa and Middle East, ...) of the company account for less than 5% of the total revenue earned in the year 1999 to 2000?

(1) 1 (2) 2 (3) 3 (4) None of the above

119. How many operations registered a sustained yearly increase in income before taxes and charges from 1998 to 2000?

(1) 3 (2) 4 (3) 5 (4) None of the above

120. Ignoring the loss making operations of the company in 1998, for how many operations was the percentage increase in net income before taxes and charges higher than the average increase from 1998 to 1999?

(1) 0 (2) 1 (3) 2 (4) None of the above

121. If profitability is defined as the ratio of net income after taxes and charges to expenses, then which of the following statements is true?

(1) The Far East operations witnessed its highest profitability in 1998.
(2) The Northern Sea operations increased its profitability from 1998 to 1999.
(3) The operations in Argentina witnessed a decrease in profitability from 1998 to 1999.
(4) Both 2 and 3 are true.

122. In the year 2000, which among the following countries had the best profitability?

(1) North Africa and Middle East (2) Spain
(3) Rest of Latin America (4) Far East

123. If efficiency is defined as the ratio of revenue to expenses, then which operation was the least efficient in the year 2000?

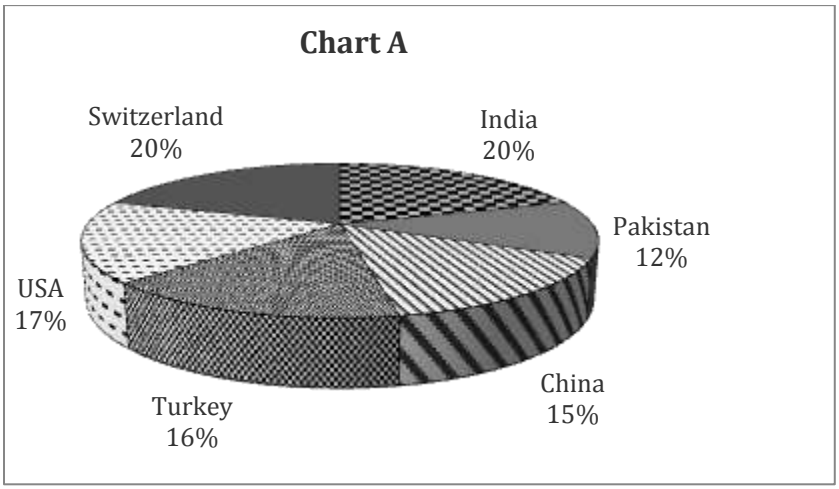
(1) Spain (2) Argentina (3) Far East (4) None of the above

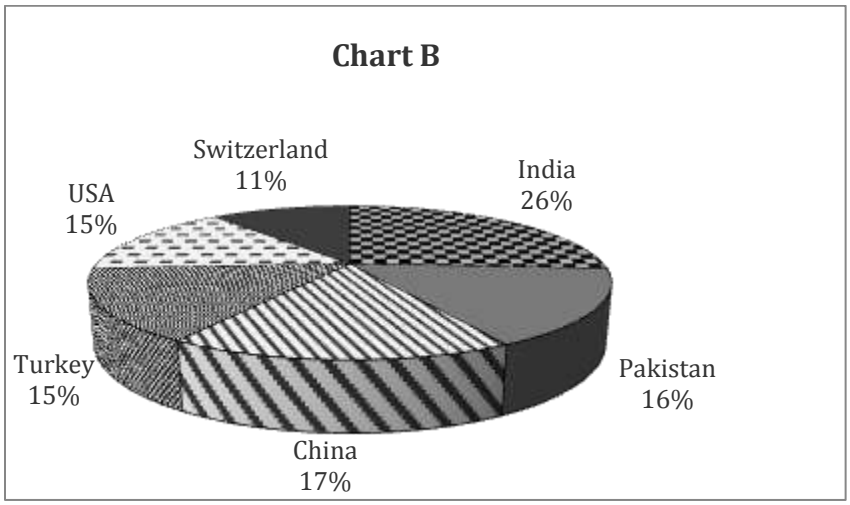
124. Of the following statements which is not true?

(1) The operations in Spain had the best efficiency in 2000.
(2) The Far East operations witnessed an efficiency improvement from 1999 to 2000.
(3) The Northern Sea operations witnessed an efficiency improvement from 1998 to 1999.
(4) In the year 1998, the operations in rest of Latin America were the least efficient.

Answer questions 125 and 126 based on the following information:

Chart A represents the distribution by value of top 6 suppliers of MFA Textiles in 1995. The total value of Chart A is 5760 million Euro.
Chart B represents the distribution by quantity of top 6 suppliers of MFA Textiles in 1995. The total value of Chart B is 1.05 million tons.





125. The country which has the highest average price is:

(1) USA (2) Switzerland (3) Turkey (4) India

126. The average price (Euro per kg) in Turkey is roughly:

(1) 6.20 (2) 5.80 (3) 4.20 (4) 4.80

Answer questions 127 to 132 based on the following information:

There are 6 refineries, 7 depots, 9 districts. The refineries are BB, BC, BD, BE, BF, BG. The depots are AA, AB, AC, AD, AE, AF and AG and the districts are AAA, AAB, AAC, AAD, AAE, AAF, AAG, AAH, AAI.

Table A shows the cost of transporting one unit from refinery to depot.
Table B shows the cost of transporting one unit from depot to districts.

Table A

	BB	BC	BD	BE	BF	BG
AA	928.2	537.2	567.8	589.9	800.1	323.4
AB	311.8	595.7	885.7	759.9	793.1	420.1
AC	451.1	0	320.1	720.1	1000.1	404.5
AD	371.1	50.1	350.1	650.4	980.1	525.3
AE	1137.3	314.5	0	1157.7	406.3	617.5
AF	617.1	516.8	756.5	1065.9	623.9	509.4
AG	644.3	299.2	537.2	1093.1	725.8	827.4

Table B

	AA	AB	AC	AD	AE	AF	AG
AAA	571.1	205	352	159	434.5	178	337
AAB	200	337.5	291	201	0	980.7	434
AAC	100	0	275	277	850	770.5	835
AAD	0	415.7	350	760	300	560	444.7
AAE	223.5	300	440	1033	880	325	526.5
AAF	577.5	725	443.5	560	1035.3	570	530
AAG	340	410.6	886.7	0	800.7	680.5	800
AAH	627	556.5	1023	1024	759	1025.7	300
AAI	439	738	980	1031.7	1024	900	757

127. The minimum cost of sending one unit from any refinery to any district is:

(1) Rs. 0 (2) Rs. 350 (3) Rs. 320 (4) Rs. 50

128. How many possible ways are there for sending one unit from any refinery to any district?

(1) 63 (2) 42 (3) 54 (4) 378

129. The largest cost of sending one unit from any refinery to district is:

(1) Rs. 2172.60 (2) Rs. 2193.0 (3) Rs. 2091.0 (4) None of the above

130. The minimum cost of transportation of one unit from refinery BD to any district is:

(1) Rs. 125 (2) Rs. 0 (3) Rs. 375 (4) None of the above

131. The minimum cost of transportation from any refinery to AAG district is:

(1) Rs. 0 (2) Rs. 137 (3) Rs. 140 (4) None of the above

132. The minimum cost of transportation from refinery BE to district AAA is:

(1) Rs. 1257 (2) Rs. 1161 (3) Rs. 1231 (4) None of the above

Answer questions 133 to 134 based on the following instructions:

Each question is followed by two statements A and B.
Answer (1) if the question can be solved by any one of the statements, but not the other one.
Answer (2) if the question can be solved by using either of the two statements.
Answer (3) if the question can be solved by using both the statements together and not by any one of them.
Answer (4) if the question cannot be solved with the help of the given data and more data is required.

133. In a hockey match, the Indian team was behind by 2 goals with 5 minutes remaining. Did they win the match?

A. Deepak Thakur, the Indian striker scored 3 goals in the last 5 minutes of the match.
B. Korea scored a total of 3 goals in the match.

(1) 1 (2) 2
(3) 3 (4) 4

134. Four students were added to a dance class. Would the teacher be able to divide her students evenly into a dance team (or teams) of 8?

A. If 12 students were added, then the teacher could put everyone in teams of 8 without any leftovers.
B. The number of students in the class is currently not divisible by 8.

(1) 1 (2) 2
(3) 3 (4) 4

135. Is $x = y$?

A. $(x + y)\left(\frac{1}{x} + \frac{1}{y}\right) = 4$

B. $(x - 50)^2 = (y - 50)^2$

(1) 1 (2) 2
(3) 3 (4) 4

Answer questions 136 to 140 based on the following instructions:

The question is followed by two statements A and B. Answer each question using the following instructions.
Mark (1) if the question can be answered by using statement A alone but not by using statement B alone.
Mark (2) if the question can be answered by using statement B alone but not by using statement A alone.
Mark (3) if the question can be answered by using both the statements together but not by using either of the statements alone.
Mark (4) if the question cannot be answered on the basis of the two statements.

136. A dress was initially listed at a price that would have fetched the store a profit of 20% on the wholesale cost. What was the wholesale cost of the dress?

A. After reducing the listed price by 10% the dress was sold for a net profit of 10 dollars.
B. The dress was sold for 50 dollars.

(1) 1 (2) 2
(3) 3 (4) 4

137. Is 500 the average (arithmetic mean) score of the GMAT?

A. Half of the people who take GMAT score above 500 and half of the people score below 500.
B. The highest GMAT score is 800 and the lowest score is 200.

(1) 1 (2) 2
(3) 3 (4) 4

138. Is $|x - 2| < 1$?

A. $|x| > 1$
B. $|x - 1| < 2$

(1) 1 (2) 2
(3) 3 (4) 4

139. Members in a club either speak French or Russian or both. Find the number of members in a club who speak only French.

A. There are 300 members in the club and the number of members who speak both French and Russian is 196.
B. The number of members who speak only Russian is 58.

(1) 1 (2) 2
(3) 3 (4) 4

140. A sum of Rs. 38,500 was divided among Jagdish, Punit and Girish. Who received the minimum amount?

A. Jagdish received 2/9 of what Punit and Girish together received.
B. Punit received 3/11 of what Jagdish and Girish together received.

(1) 1 (2) 2
(3) 3 (4) 4

Answer questions 141 to 144 based on the following information:

In a country, the following signals are applicable:

3 Red Lights	Stop
2 Red Lights	Tum Left
1 Red Light	Tum Right
3 Green Lights	Go @ 100 kmph
2 Green Lights	Go @ 40 kmph
1 Green Light	Go @ 20 kmph

A man headed towards north and follows the given signals as:

Starting Point	1 Green Light
After half-an-hour, 1st Signal	2 Red and 2 Green Lights
After 15 minutes, 2nd Signal	1 Red Light
After half-an-hour, 3rd Signal	1 Red and 3 Green Lights
After 24 minutes, 4th Signal	2 Red and 2 Green Lights
After 15 minutes, 5th and Last Signal	3 Red Lights

141. What is the total distance covered by the man till the last signal?

(1) 90 km (2) 120 km
(3) 110 km (4) 84 km

142. What is his net displacement with respect to the starting point?

(1) 40 km towards South West
(2) 50 km towards North East
(3) 40 km towards North East
(4) 60 km towards South West

143. If the first signal after the starting point, is 1 Red and 2 Green lights, then what is the total distance covered by the man till the last signal?

(1) 90 km (2) 50 km
(3) 40 km (4) 80 km

144. Instead of heading North, if the man was heading South, then by the end of the journey, he was

(1) 50 km towards South, 50 km towards West from his starting point.
(2) 50 km towards North, 50 km towards West from his starting point.
(3) 60 km towards North, 40 km towards West from his starting point.
(4) 40 km towards South, 30 km towards West from his starting point.

Answer questions 145 to 148 based on the following instructions:

Each question given below is followed by five statements numbered I, II, III, IV and V. The answer choice given below each question consists of one or more statements. You have to choose the choice which gives more relevant / useful information in answering the question correctly. Read all the statements together with the question and choose your answer.

145. For what reason Purohit did not get the offer of employment?

Statement:

I. Purohit passed the interview.
II. Purohit's friend passed the medical test who passed the interview along with Purohit.
III. Purohit's father did not want him to take the job.
IV. Purohit has another employment offer from another company.
V. Purohit did not clear the mandatory medical test.

(1) III and IV only
(2) III, IV and V only
(3) I, III and IV only
(4) V only

146. What were the possible reasons due to which DESCO incurred losses for the last two years?

Statement:

I. The company's shares are not registered in the stock exchange.
II. The company does not export its products.
III. The company has an inefficient labour force.
IV. The price of its product has fallen in the last two years due to competitive market.
V. Entry of similar foreign goods at a cheaper rate.

(1) Only III, IV and V
(2) Only II, III and IV
(3) Only IV and V
(4) Only I and II

147. On which day of the week did Sunil get his letter of promotion?

Statement:

I. Sunil purchased a new shirt on Friday
II. Sunil was given a party that Saturday.
III. Sunil was given the letter of promotion on the day before he purchased the shirt.
IV. Tuesday being his birthday, Sunil gave a party to all his friends.
V. Sunil's friend was promoted on Friday.

(1) I and II only
(2) II, III and IV only
(3) I and III only
(4) II, III and V only

148. Who among A, B, C, D and E is the heaviest?

Statement:

I. B and C are heavier than A and D.
II. C is heavier than D.
III. C is heavier than A and lighter than B.
IV. E is heavier than B
V. D is lighter than E.

(1) I, III and IV only
(2) II, III and V only
(3) III and IV only
(4) I, III and V only

Answer questions 149 and 150 based on the following information:

- A causes B or C, but not both.
- F occurs only if B occurs.
- D occurs if B or C occurs.
- E occurs only if C occurs.
- J occurs only if E or F occurs.
- D causes G or H or both.
- H occurs if E occurs.
- G occurs if F occurs.

149. If A occurs, which may occur?

I. F and G
II. E and H
III. D

(1) I only
(2) II only
(3) III only
(4) Either I and III or II and III, but not both.

150. Which of these may occur as a result of a cause not mentioned?

(1) E
(2) Both E and F
(3) Either B or C
(4) J

Answer Key

SECTION I			
Q.	**Ans.**	**Q.**	**Ans.**
1	**4**	31	**4**
2	**1**	32	**3**
3	**1**	33	**2**
4	**2**	34	**3**
5	**1**	35	**2**
6	**1**	36	**3**
7	**4**	37	**1**
8	**4**	38	**3**
9	**3**	39	**4**
10	**2**	40	**2**
11	**4**	41	**3**
12	**3**	42	**2**
13	**2**	43	**4**
14	**3**	44	**2**
15	**4**	45	**2**
16	**1**	46	**1**
17	**3**	47	**2**
18	**4**	48	**1**
19	**3**	49	**3**
20	**1**	50	**4**
21	**3**		
22	**2**		
23	**2**		
24	**4**		
25	**4**		
26	**1**		
27	**1**		
28	**4**		
29	**3**		
30	**1**		

SECTION II			
Q.	**Ans.**	**Q.**	**Ans.**
51	**3**	81	2
52	**4**	82	3
53	**3**	83	2
54	**1**	84	2
55	**4**	85	3
56	**4**	86	**4**
57	**4**	87	**1**
58	**4**	88	**4**
59	**2**	89	**3**
60	**2**	90	**4**
61	**1**	91	**3**
62	**4**	92	**4**
63	**4**	93	**4**
64	**3**	94	**2**
65	**4**	95	**2**
66	**2**	96	**3**
67	**3**	97	**1**
68	**4**	98	**1**
69	**3**	99	**1**
70	**1**	100	**2**
71	**1**		
72	**4**		
73	**1**		
74	**2**		
75	**2**		
76	**4**		
77	**4**		
78	**2**		
79	**2**		
80	**3**		

SECTION III			
Q.	**Ans.**	**Q.**	**Ans.**
101	**2**	131	**4**
102	**2**	132	**4**
103	**4**	133	**4**
104	**3**	134	**1**
105	**1**	135	**1**
106	**3**	136	**1**
107	**2**	137	**4**
108	**3**	138	**3**
109	**3**	139	**3**
110	**2**	140	**3**
111	**1**	141	**1**
112	**1**	142	**2**
113	**1**	143	**1**
114	**4**	144	**4**
115	**1**	145	**4**
116	**4**	146	**1**
117	**3**	147	**3**
118	**3**	148	**1**
119	**2**	149	**4**
120	**3**	150	**3**
121	**2**		
122	**2**		
123	**4**		
124	**4**		
125	**2**		
126	**2**		
127	**1**		
128	**4**		
129	**2**		
130	**2**		

A4 PREVIOUS CAT QUESTION PAPER

CAT 2007

Before the Test:

1. DO NOT REMOVE THE SEAL OF THIS BOOKLET UNTIL THE SIGNAL TO START IS GIVEN.
2. Keep only a pencil, eraser and sharpener with you. DO NOT KEEP with you books, rulers, slide rules, drawing instruments, calculators (including watch calculators), pagers, cellular phones, stop watches or any other device or loose paper. These should be left at a place indicated by the invigilator.
3. Use only HB pencil to fill in the Answer Sheet.
4. Enter in your Answer Sheet: (a) in Box 3, the Test Form Number that appears at the bottom of this page, (b) in Box 4, the Test Booklet Serial Number that appears at the top of this page.
5. Ensure that your personal data have been entered correctly on Side - II of the Answer Sheet.
6. Ensure that you have entered your 8-digit Test Registration Number in Box 2 of the Answer Sheet correctly. Start entering the number from the leftmost cell, leaving the last three cells blank.

At the start of the Test:

1. As soon as the signal to start is given, open the Test Booklet.
2. This Test Booklet contains 21 pages, including the blank ones. Immediately after opening the Test Booklet, verify that all the pages are printed properly and are in order. If there is a problem with your Test Booklet, immediately inform the invigilator. You will be provided with a replacement.

How to answer:

1. This test contains 75 questions in three sections. **There are 25 questions in Section I, 25 questions in Section II and 25 questions in Section III**. You have two and half hours to complete the test. In distributing the time over the three sections, please bear in mind that you need to demonstrate your competence in all three sections.
2. Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles on the Answer Sheet. Each question has only one correct answer.
3. **All questions carry 4 marks each. For a wrong answer you will lose one-fourth of the marks allotted to the question.**
4. Do your rough work only on the Test Booklet and NOT on the Answer Sheet.
5. Follow the instructions of the invigilator. Students found violating the instructions will be disqualified.

After the Test:

1. At the end of the test, remain seated. The invigilator will collect the Answer Sheet from your seat. Do not leave the hall until the invigilator announces “You may leave now”. The invigilator will make this announcement only after collecting the Answer Sheets from all the students in the room.
2. You may retain this Test Booklet with you.

Test Form Number: 111

Section I

1. The price of Darjeeling tea (in rupees per kilogram) is 100 + 0.10n, on the n^{th} day of 2007 (n = 1, 2, ..., 100), and then remains constant. On the other hand, the price of Ooty tea (in rupees per kilogram) is 89 + 0.15n, on the n^{th} day of 2007 (n = 1, 2, ..., 365). On which date in 2007 will the prices of these two varieties of tea be equal?

(1) May 21 (2) April 11 (3) May 20
(4) April 10 (5) June 30

2. A quadratic function $f(x)$ attains a maximum of 3 at x = 1. The value of the function at x = 0 is 1. What is the value of $f(x)$ at x = 10?

(1) –119 (2) –159 (3) –110
(4) –180 (5) –105

3. Two circles with centres P and Q cut each other at two distinct points A and B. The circles have the same radii and neither P nor Q falls within the intersection of the circles. What is the smallest range that includes all possible values of the angle AQP in degrees?

(1) Between 0 and 90
(2) Between 0 and 30
(3) Between 0 and 60
(4) Between 0 and 75
(5) Between 0 and 45

Answer questions 4 and 5 based on the information given below.

Let S be the set of all pairs (i, j) where $1 \le i < j \le n$ and $n \ge 4$. Any two distinct members of S are called "friends" if they have one constituent of the pairs in common and "enemies" otherwise. For example, if n = 4, then S = {(1, 2), (1, 3), (1, 4), (2, 3), (2, 4), (3, 4)}. Here, (1, 2) and (1, 3) are friends, (1, 2) and (2, 3) are also friends, but (1, 4) and (2, 3) are enemies.

4. For general n, how many enemies will each member of S have?

(1) $n - 3$

(2) $\frac{1}{2}(n^2 - 7n + 16)$

(3) $2n - 7$

(4) $\frac{1}{2}(n^2 - 5n + 6)$

(5) $\frac{1}{2}(n^2 - 7n + 14)$

5. For general n, consider any two members of S that are friends. How many other members of S will be common friends of both these members?

(1) $\frac{1}{2}(n^2 - 5n + 8)$

(2) $2n - 6$

(3) $\frac{1}{2}n(n - 3)$

(4) $n - 2$

(5) $\frac{1}{2}(n^2 - 7n + 16)$

Answer questions 6 and 7 based on the information given below.

Shabnam is considering three alternatives to invest her surplus cash for a week. She wishes to guarantee maximum returns on her investment. She has three options, each of which can be utilized fully or partially in conjunction with others.

Option A: Invest in a public sector bank. It promises a return of +0.10%

Option B: Invest in mutual funds of ABC Ltd. A rise in the stock market will result in a return of +5%, while a fall will entail a return of –3%

Option C: Invest in mutual funds of CBA Ltd. A rise in the stock market will result in a return of –2.5%, while a fall will entail a return of +2%

6. The maximum guaranteed return to Shabnam is:

(1) 0.25% (2) 0.10% (3) 0.20%
(4) 0.15% (5) 0.30%

7. What strategy will maximize the guaranteed return to Shabnam?

(1) 100% in option A
(2) 36% in option B and 64% in option C

(3) 64% in option B and 36% in option C
(4) 1/3 in each of the three options
(5) 30% in option A, 32% in option B and 38% in option C

Answer questions 8 and 9 based on the information given below

Cities A and B are in different time zones. A is located 3000 km east of B. The table below describes the schedule of an airline operating non-stop flights between A and B. All the times indicated are local and on the same day.

Assume that planes cruise at the same speed in both directions. However, the effective speed is influenced by a steady wind blowing from east to west at 50 km per hour.

Departure		Arrival	
City	Time	City	Time
B	8:00 a.m.	A	3:00 p.m.
A	4:00 p.m.	B	8:00 p.m.

8. What is the time difference between A and B?

(1) 1 hour and 30 minutes
(2) 2 hours
(3) 2 hours and 30 minutes
(4) 1 hour
(5) Cannot be determined

9. What is the plane's cruising speed in km per hour?

(1) 700 (2) 550 (3) 600
(4) 500 (5) Cannot be determined

10. Consider all four digit numbers for which the first two digits are equal and the last two digits are also equal. How many such numbers are perfect squares?

(1) 3 (2) 2 (3) 4 (4) 0 (5) 1

11. In a tournament, there are n teams T_1 , T_2 ....., T_n with $n > 5$. Each team consists of k players, $k > 3$. The following pairs of teams have one player in common:
T_1 & T_2 , T_2 & T_3 ,....., T_{n-1} & T_n , and T_n & T_1.
No other pair of teams has any player in common. How many players are participating in the tournament, considering all the n teams together?

(1) $n(k-1)$ (2) $k(n-1)$ (3) $n(k-2)$
(4) $k(k-2)$ (5) $(n-1)(k-1)$

Answer questions 12 and 13 based on the information given below.

Mr. David manufactures and sells a single product at a fixed price in a niche market. The selling price of each unit is Rs. 30. On the other hand, the cost, in rupees, of producing x units is $240 + bx + cx^2$, where b and c are some constants. Mr. David noticed that doubling the daily production from 20 to 40 units increases the daily production cost by 66.66%. However, an increase in daily production from 40 to 60 units results in an increase of only 50% in the daily production cost. Assume that demand is unlimited and that Mr. David can sell as much as he can produce. His objective is to maximize the profit.

12. How many units should Mr. David produce daily?

(1) 130 (2) 100 (3) 70
(4) 150 (5) Cannot be determined

13. What is the maximum daily profit, in rupees, that Mr. David can realize from his business?

(1) 620 (2) 920 (3) 840
(4) 760 (5) Cannot be determined

Answer questions 14 and 15 based on the information given below.

Let $a_1 = p$ and $b_1 = q$, where p and q are positive quantities.

Define:
$a_n = pb_{n-1}$ $b_n = qb_{n-1}$, for even $n > 1$
and $a_n = pa_{n-1}$ $b_n = qa_{n-1}$, for odd $n > 1$.

14. Which of the following best describes $a_n + b_n$ for even n?

(1) $q(pq)^{\frac{1}{2}n-1}(p+q)^{\frac{1}{2}n}$

(2) $q(pq)^{\frac{1}{2}n-1}(p+q)$

(3) $qp^{\frac{1}{2}n-1}(p+q)$

(4) $q^{\frac{1}{2}n}(p+q)$

(5) $q^{\frac{1}{2}n}(p+q)^{\frac{1}{2}n}$

15. If $p = 1/3$ and $q = 2/3$, then what is the smallest odd n such that $a_n + b_n < 0.01$?

(1) 7 (2) 13 (3) 11 (4) 9 (5) 15

Answer questions 16 to 19 based on the following instructions:

Mark (1) if the question can be answered using A alone but not using B alone.
Mark (2) if the question can be answered using B alone but not using A alone.
Mark (3) if the question can be answered using A and B together, but not using either A or B alone.
Mark (4) if the question cannot be answered even using A and B together.

16. The average weight of a class of 100 students is 45 kg. The class consists of two sections, I and II, each with 50 students. The average weight, W_I, of Section I is smaller than the average weight, W_{II}, of Section II. If the heaviest student, say Deepak, of Section II is moved to Section I, and the lightest student, say Poonam, of Section I is moved to Section II, then the average weights of the two sections are switched, i.e., the average weight of Section I becomes W_{II} and that of Section II becomes W_I. What is the weight of Poonam?

A. $W_{II} - W_I = 1.0$
B. Moving Deepak from Section II to I (without any move from I to II) makes the average weights of the two sections equal.

17. Consider integers x, y and z. What is the minimum possible value of $x^2 + y^2 + z^2$?

A. $x + y + z = 89$
B. Among x, y, z two are equal.

18. Rahim plans to draw a square JKLM with a point O on the side JK but is not successful. Why is Rahim unable to draw the square?

A. The length of OM is twice that of OL.
B. The length of OM is 4 cm.

19. ABC Corporation is required to maintain at least 400 Kilolitres of water at all times in its factory, in order to meet safety and regulatory requirements. ABC is considering the suitability of a spherical tank with uniform wall thickness for the purpose. The outer diameter of the tank is 10 meters. Is the tank capacity adequate to meet ABC's requirements?

A. The inner diameter of the tank is at least 8 meters.
B. The tank weighs 30,000 kg when empty, and is made of a material with density of 3 gm/cc.

20. Suppose you have a currency, named Miso, in three denominations: 1 Miso, 10 Misos and 50 Misos. In how many ways can you pay a bill of 107 Misos?

(1) 17 (2) 16 (3) 18 (4) 15 (5) 19

21. How many pairs of positive integers m, n satisfy $1/m + 4/n = 1/12$ where n is an odd integer less than 60?

(1) 6 (2) 4 (3) 7 (4) 5 (5) 3

22. A confused bank teller transposed the rupees and paise when he cashed a cheque for Shailaja, giving her rupees instead of paise and paise instead of rupees. After buying a toffee for 50 paise, Shailaja noticed that she was left with exactly three times as much as the amount on the cheque. Which of the following is a valid statement about the cheque amount?

(1) Over Rupees 13 but less than Rupees 14
(2) Over Rupees 7 but less than Rupees 8
(3) Over Rupees 22 but less than Rupees 23
(4) Over Rupees 18 but less than Rupees 19
(5) Over Rupees 4 but less than Rupees 5

23. Consider the set $S = \{2, 3, 4, ..., 2n + 1\}$, where n is a positive integer larger than 2007. Define X as the average of the odd integers in S and Y as the average of the even integers in S. What is the value of $X - Y$?

(1) 0 (2) 1 (3) $n/2$
(4) $n + 1/2n$ (5) 2008

24. Ten years ago, the ages of the members of a joint family of eight people added up to 231 years. Three years later, one member died at the age of 60 years and a child was born during the same year. After another three years, one more member died, again at 60, and a child was born

during the same year. The current average age of this eight member joint family is nearest to:

(1) 23 years (2) 22 years
(3) 21 years (4) 25 years
(5) 24 years

25. A function $f(x)$ satisfies $f(1) = 3600$, and $f(1) + f(2) + ... + f(n) = n^2 f(n)$, for all positive integers $n > 1$. What is the value of $f(9)$?

(1) 80 (2) 240 (3) 200
(4) 100 (5) 120

Section II

Answer questions 26 to 29 based on the following instructions:

Each question is followed by two statements, I and II. Answer each question using the following instructions:
Mark (1) if the question can be answered by using statement A alone but not by using statement B alone.
Mark (2) if the question can be answered by using statement B alone but not by using statement A alone.
Mark (3) if the question can be answered by using either of the statements alone.
Mark (4) if the question can be answered by using both the statements together but not by either of the statements alone.
Mark (5) if the question cannot be answered on the basis of the two statements.

26. In a football match, at half-time, Mahindra and Mahindra Club was trailing by three goals. Did it win the match?

A. In the second half Mahindra and Mahindra Club scored four goals.
B. The opponent scored four goals in the match.

27. In a particular school, sixty students were athletes. Ten among them were also among the top academic performers. How many top academic performers were in the school?

A. Sixty per cent of the top academic performers were not athletes.
B. All the top academic performers were not necessarily athletes.

28. Five students Atul, Bala, Chetan, Dev and Ernesto were the only ones who participated in a quiz contest. They were ranked based on their scores in the contest. Dev got a higher rank as compared to Ernesto, while Bala got a higher rank as compared to Chetan. Chetan's rank was lower than the median. Who among the five got the highest rank?

A. Atul was the last rank holder.
B. Bala was not among the top two rank holders.

29. Thirty percent of the employees of a call centre are males. Ten per cent of the female employees have an engineering background. What is the percentage of male employees with engineering background?

A. Twenty five per cent of the employees have engineering background.
B. Number of male employees having an engineering background is 20% more than the number of female employees having an engineering background.

Answer questions 30 to 33 based on the following information:

The proportion of male students and the proportion of vegetarian students in a school are given below. The school has a total of 800 students, 80% of whom are in the Secondary Section and rest equally divided between Class 11 and 12.

	Male (M)	Vegetarian (V)
Class 12	0.6	
Class 11	0.55	0.5
Secondary Section		0.55
Total	0.475	0.53

30. What is the percentage of vegetarian students in Class 12?

(1) 40 (2) 45 (3) 50 (4) 55 (5) 60

31. In Class 12, twenty five per cent of the vegetarians are male. What is the difference between the number of female vegetarians and male non-vegetarians?

(1) less than 8 (2) 10 (3) 12
(4) 14 (5) 16

32. What is the percentage of male students in the secondary section?

(1) 40 (2) 45 (3) 50 (4) 55 (5) 60

33. In the Secondary Section, 50% of the students are vegetarian males. Which of the following statements is correct?

(1) Except vegetarian males, all other groups have same number of students.
(2) Except non-vegetarian males, all other groups have same number of students.
(3) Except vegetarian females, all other groups have same number of students.
(4) Except non-vegetarian females, all other groups have same number of students
(5) All of the above groups have the same number of students.

Answer questions 34 to 37 based on the following information:

The following table shows the break-up of actual costs incurred by a company in last five years (year 2002 to year 2006) to produce a particular product.

The production capacity of the company is 2000 units. The selling price for the year 2006 was Rs. 125 per unit. Some costs change almost in direct proportion to the change in volume of production, while others do not follow any obvious pattern of change with respect to the volume of production and hence are considered fixed. Using the information provided for the year 2006 as the basis for projecting the figures for the year 2007, answer the following questions.

	Year 2002	**Year 2003**	**Year 2004**	**Year 2005**	**Year 2006**
Volume of production and sale (units)	1000	900	1100	1200	1200
Costs (Rs.)					
Material	50,000	45,100	55,200	59,900	60,000
Labour	20,000	18,000	22,100	24,150	24,000
Consumables	2,000	2,200	1,800	1,600	1,400
Rent of building	1,000	1,000	1,100	1,100	1,200
Rates and taxes	400	400	400	400	400
Repair and maintenance expenses	800	820	780	790	800
Operating cost of machines	30,000	27,000	33,500	36,020	36,000
Selling and marketing expenses	5,750	5,800	5,800	5,750	5,800

34. What is the approximate cost per unit in rupees, if the company produces and sells 1400 units in the year 2007?

(1) 104 (2) 107 (3) 110 (4) 115 (5) 116

35. What is the minimum number of units that the company needs to produce and sell to avoid any loss?

(1) 313 (2) 350 (3) 384 (4) 747 (5) 928

36. Given that the company cannot sell more than 1700 units, and it will have to reduce the price by Rs. 5 for all units, if it wants to sell more than 1400 units, what is the maximum profit, in rupees, that the company can earn?

(1) 25,400 (2) 24,400 (3) 31,400 (4) 32,900 (5) 32,000

37. If the company reduces the price by 5%, it can produce and sell as many units as it desires. How many units the company should produce to maximize its profit?

(1) 1400 (2) 1600 (3) 1800 (4) 1900 (5) 2000

Answer questions 38 to 41 based on the following information:

The table below shows the comparative costs, in US Dollars, of major surgeries in USA and a select few Asian countries.

Procedure	Comparative Costs in USA and some Asian countries (in US Dollars)				
	USA	India	Thailand	Singapore	Malaysia
Heart Bypass	130000	10000	11000	18500	9000
Heart Valve Replacement	160000	9000	10000	12500	9000
Angioplasty	57000	11000	13000	13000	11000
Hip Replacement	43000	9000	12000	12000	10000
Hysterectomy	20000	3000	4500	6000	3000
Knee Replacement	40000	8500	10000	13000	8000
Spinal Fusion	62000	5500	7000	9000	6000

The equivalent of one US Dollar in the local currencies is given below.

	1 US Dollar equivalent	
India	40.928	Rupees
Malaysia	3.51	Ringits
Thailand	32.89	Bahts
Singapore	1.53	S Dollars

A consulting firm found that the quality of the health services were not the same in all the countries above. A poor quality of a surgery may have significant repercussions in future, resulting in more cost in correcting mistakes. The cost of poor quality of surgery is given in the table below.

Procedure	Comparative Costs of Poor Quality in USA and some Asian countries (in US Dollars '000)				
	USA	India	Thailand	Singapore	Malaysia
Heart Bypass	0	3	3	2	4
Heart Valve Replacement	0	5	4	5	5
Angioplasty	0	5	5	4	6
Hip Replacement	0	7	5	5	8
Hysterectomy	0	5	6	5	4
Knee Replacement	0	9	6	4	4
Spinal Fusion	0	5	6	5	6

38. The rupee value increases to Rs. 35 for a US Dollar, and all other things including quality, remain the same. What is the approximate difference in cost, in US Dollars, between Singapore and India for a Spinal Fusion, taking this change into account?

(1) 700 (2) 2500 (3) 4500 (4) 8000
(5) No difference

39. Approximately, what difference in amount in Bahts will it make to a Thai citizen if she were to get a hysterectomy done in India instead of in her native country, taking into account the cost of poor quality? It costs 7500 Bahts for one-way travel between Thailand and India.

(1) 23500 (2) 40500 (3) 57500 (4) 67500 (5) 75000

40. A US citizen is hurt in an accident and requires an angioplasty, hip replacement and a knee replacement. Cost of foreign travel and stay is not a consideration since the government will take care of it. Which country will result in the cheapest package, taking cost of poor quality into account?

(1) India (2) Thailand (3) Malaysia (4) Singapore (5) USA

41. Taking the cost of poor quality into account, which country/countries will be the most expensive for knee replacement?

(1) India (2) Thailand (3) Malaysia (4) Singapore
(5) India and Singapore

Answer questions 42 to 46 based on the following information:

A low-cost airline company connects ten Indian cities, A to J. The table below gives the distance between a pair of airports and the corresponding price charged by the company. Travel is permitted only from a departure airport to an arrival airport. The customers do not travel by a route where they have to stop at more than two intermediate airports.

Sector No.	Airport of Departure	Airport of Arrival	Distance between the Airports (km)	Price (Rs.)
1	A	B	560	670
2	A	C	790	1350
3	A	D	850	1250
4	A	E	1245	1600
5	A	F	1345	1700
6	A	G	1350	2450
7	A	H	1950	1850
8	B	C	1650	2000
9	B	H	1750	1900
10	B	I	2100	2450
11	B	J	2300	2275
12	C	D	460	450
13	C	F	410	430
14	C	G	910	1100
15	D	E	540	590
16	D	F	625	700
17	D	G	640	750
18	D	H	950	1250
19	D	J	1650	2450
20	E	F	1250	1700
21	E	G	970	1150
22	E	H	850	875
23	F	G	900	1050
24	F	I	875	950
25	F	J	970	1150
26	G	I	510	550
27	G	J	830	890
28	H	I	790	970
29	H	J	400	425
30	I	J	460	540

42. What is the lowest price, in rupees, a passenger has to pay for travelling by the shortest route from A to J?

(1) 2275 (2) 2850 (3) 2890 (4) 2930 (5) 3340

43. The company plans to introduce a direct flight between A and J. The market research results indicate that all its existing passengers travelling between A and J will use this direct flight if it is priced 5% below the minimum price that they pay at present. What should the company charge approximately, in rupees, for this direct flight?

(1) 1991 (2) 2161 (3) 2707 (4) 2745 (5) 2783

44. If the airports C, D and H are closed down owing to security reasons, what would be the minimum price, in rupees, to be paid by a passenger travelling from A to J?

(1) 2275 (2) 2615 (3) 2850 (4) 2945 (5) 3190

45. If the prices include a margin of 10% over the total cost that the company incurs, what is the minimum cost per kilometer that the company incurs in flying from A to J?

(1) 0.77 (2) 0.88 (3) 0.99 (4) 1.06 (5) 1.08

46. If the prices include a margin of 15% over the total cost that the company incurs, which among the following is the distance to be covered in flying from A to J that minimizes the total cost per kilometer for the company?

(1) 2170 (2) 2180 (3) 2315 (4) 2350 (5) 2390

Answer questions 47 to 50 based on the following information:

A health-drink company's R&D department is trying to make various diet formulations, which can be used for certain specific purposes. It is considering a choice of 5 alternative ingredients (O, P, Q, R, and S), which can be used in different proportions in the formulations. The table below gives the composition of these ingredients. The cost per unit of each of these ingredients is O: 150, P: 50, Q: 200, R: 500, S: 100.

	Composition			
Ingredient	Carbohydrate %	Protein %	Fat %	Minerals %
O	50	30	10	10
P	80	20	0	0
Q	10	30	50	10
R	5	50	40	5
S	45	50	0	5

47. The company is planning to launch a balanced diet required for growth needs of adolescent children. This diet must contain at least 30% each of carbohydrate and protein, no more than 25% fat and at least 5% minerals. Which one of the following combinations of equally mixed ingredients is feasible?

(1) O and P (2) R and S (3) P and S (4) Q and R (5) O and S

48. For a recuperating patient, the doctor recommended a diet containing 10% minerals and at least 30% protein. In how many different ways can we prepare this diet by mixing at least two ingredients?

(1) One (2) Two (3) Three (4) Four (5) None

49. Which among the following is the formulation having the lowest cost per unit for a diet having 10% fat and at least 30% protein? The diet has to be formed by mixing two ingredients.

(1) P and Q (2) P and S (3) P and R (4) Q and S (5) R and S

50. In what proportion should P, Q and S be mixed to make a diet having at least 60% carbohydrate at the lowest per unit cost?

(1) 2 : 1 : 3 (2) 4 : 1 : 2 (3) 2 : 1 : 4 (4) 3 : 1: 2 (5) 4 : 1 : 1

Section III

Instructions for questions 51 to 53:

Each of the questions below contains a number of sentences. Each sentence has pairs of word(s)/phrases that are highlighted. From the highlighted word(s)/phrase(s), select the most appropriate word(s)/phrase(s) to form correct sentences. Then, from the options given, choose the best one.

51. The cricket council that **was**[A]**/were**[B] elected last March **is**[A]**/are**[B] at sixes and sevens over new rules. The critics **censored**[A]**/censured**[B] the new movie because of its social inaccessibility. Amit's explanation for missing the meeting was **credulous**[A]**/credible**[B].
She coughed **discreetly**[A]**/discretely**[B] to announce her presence.

(1) BBAAA (2) AAABA (3) BBBBA
(4) AABBA (5) BBBAA

52. The **further**[A]**/farther**[B] he pushed himself, the more disillusioned he grew. For the crowds it was more of a **historical**[A]**/historic**[B] event; for their leader, it was just another day. The old man has a healthy **distrust**[A]**/mistrust**[B] for all new technology. This film is based on a **real**[A]**/true**[B] story. One suspects that the **compliment**[A]**/complement**[B] was backhanded.

(1) BABAB (2) ABBBA (3) BAABA
(4) BBAAB (5) ABABA

53. **Regrettably**[A]**/Regretfully**[B] I have to decline your invitation. I am drawn to the poetic, **sensual**[A]**/sensuous**[B] quality of her paintings. He was **besides**[A]**/beside**[B] himself with rage when I told him what I had done. After brushing against a **stationary**[A]**/stationery**[B] truck my car turned turtle. As the water began to rise **over**[A]**/above**[B] the danger mark, the signs of an imminent flood were clear.

(1) BAABA (2) BBBAB (3) AAABA
(4) BBAAB (5) BABAB

Instructions for questions 54 - 56:

The passage given below is followed by a set of questions. Choose the most appropriate answer to each question.

To discover the relation between rules, paradigms, and normal science, consider first how the historian isolates the particular loci of commitment that have been described as accepted rules. Close historical investigation of a given specialty at a given time discloses a set of recurrent and quasi-standard illustrations of various theories in their conceptual, observational, and instrumental applications. These are the community's paradigms, revealed in its textbooks, lectures, and laboratory exercises. By studying them and by practicing with them, the members of the corresponding community learn their trade. The historian, of course, will discover in addition a penumbral area occupied by achievements whose status is still in doubt, but the core of solved problems and techniques will usually be clear. Despite occasional ambiguities, the paradigms of a mature scientific community can be determined with relative ease.

That demands a second step and one of a somewhat different kind. When undertaking it, the historian must compare the community's paradigms with each other and with its current research reports. In doing so, his object is to discover what isolable elements, explicit or implicit, the members of that community may have abstracted from their more global paradigms and deploy it as rules in their research. Anyone who has attempted to describe or analyze the evolution of a particular scientific tradition will necessarily have sought accepted principles and rules of this sort. Almost certainly, he will have met with at least partial success. But, if his experience has been at all like my own, he will have found the search for rules both more difficult and less satisfying than the search for paradigms. Some of the generalizations he employs to describe the community's shared beliefs will present more problems. Others, however, will seem a shade too strong. Phrased in just that way, or in any other way he can imagine, they would almost certainly have been rejected by some members of the group he studies. Nevertheless, if the coherence of the

research tradition is to be understood in terms of rules, some specification of common ground in the corresponding area is needed. As a result, the search for a body of rules competent to constitute a given normal research tradition becomes a source of continual and deep frustration.

Recognizing that frustration, however, makes it possible to diagnose its source. Scientists can agree that a Newton, Lavoisier, Maxwell, or Einstein has produced an apparently permanent solution to a group of outstanding problems and still disagree, sometimes without being aware of it, about the particular abstract characteristics that make those solutions permanent. They can, that is, agree in their identification of a paradigm without agreeing on, or even attempting to produce, a full interpretation or rationalization of it. Lack of a standard interpretation or of an agreed reduction to rules will not prevent a paradigm from guiding research. Normal science can be determined in part by the direct inspection of paradigms, a process that is often aided by but does not depend upon the formulation of rules and assumption. Indeed, the existence of a paradigm need not even imply that any full set of rules exists.

54. What is the author attempting to illustrate through this passage?

(1) Relationships between rules, paradigms, and normal science.
(2) How a historian would isolate a particular 'loci of commitment'.
(3) How a set of shared beliefs evolve in to a paradigm.
(4) Ways of understanding a scientific tradition.
(5) The frustrations of attempting to define a paradigm of a tradition.

55. The term 'loci of commitment' as used in the passage would most likely correspond with which of the following?

(1) Loyalty between a group of scientists in a research laboratory.
(2) Loyalty between groups of scientists across research laboratories.
(3) Loyalty to a certain paradigm of scientific inquiry.
(4) Loyalty to global patterns of scientific inquiry.
(5) Loyalty to evolving trends of scientific inquiry.

56. The author of this passage is likely to agree with which of the following?

(1) Paradigms almost entirely define a scientific tradition.
(2) A group of scientists investigating a phenomenon would benefit by defining a set of rules.
(3) Acceptance by the giants of a tradition is a sine qua non for a paradigm to emerge.
(4) Choice of isolation mechanism determines the types of paradigm that may emerge from a tradition.
(5) Paradigms are a general representation of rules and beliefs of a scientific tradition.

Instructions for questions 57 - 59:

Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

57. Characters are also part of deep structure. Characters tie events in a story together and provide a thread of continuity and meaning. Stories can be about individuals, groups, projects or whole organizations, so from an organizational studies perspective, the focal actor(s) determine the level and unit of analysis used in a study. Stories of mergers and acquisitions, for example, are commonplace. In these stories whole organizations are personified as actors. But these macro-level stories usually are not told from the perspective of the macro-level participants, because whole organizations cannot narrate their experiences in the first person. _____

(1) More generally, data concerning the identities and relationships of the characters in the story are required, if one is to understand role structure and social networks in which that process is embedded.
(2) Personification of a whole organization abstracts away from the particular actors and from traditional notions of level of analysis.

(3) The personification of a whole organization is important because stories differ depending on who is enacting various events.
(4) Every story is told from a particular point of view, with a particular narrative voice, which is not regarded as part of the deep structure.
(5) The personification of a whole organization is a textual device we use to make macro-level theories more comprehensible.

58. Nevertheless, photographs still retain some of the magical allure that the earliest daguerreotypes inspired. As objects, our photographs have changed; they have become physically flimsier as they have become more technologically sophisticated. Daguerre produced pictures on copper plates; today many of our photographs never become tangible thins, but instead remain filed away on computers and cameras, part of the digital ether that envelops the modern world. At the same time, our patience for the creation of images has also eroded. Children today are used to being tracked from birth by digital cameras and video recorders and they expect to see the results of their poses and performances instantly. The space between life as it is being lived and life as it is being displayed shrinks to a mere second.

_____

(1) Yet, despite these technical developments, photographs still remain powerful because they are reminders of the people and things we care about.
(2) Images, after all, are surrogates carried into battle by a soldier or by a traveller on holiday.
(3) Photographs, be they digital or traditional, exist to remind us of the absent, the beloved, and the dead.
(4) In the new era of the digital image, the images also have a greater potential for fostering falsehood and trickery, perpetuating fictions that seem so real we cannot tell the difference.
(5) Anyway, human nature being what it is, little time has passed after photography's inventions became means of living life through images.

59. Mma Ramotswe had a detective agency in Africa, at the foot of Kgale Hill. These were its assets: a tiny white van, two desks, two chairs, a telephone, and an old typewriter. Then there was a teapot, in which Mma Ramotswe- the only private lady detective in Botswana- brewed red bush tea. And three mugs- one for herself, one for her secretary and one for the client. What else does a detective agency really need? Detective agencies rely on human intuition and intelligence, both of which Mma Ramotswe had in abundance.

_____

(1) But there was also the view, which again would appear on no inventory.
(2) No inventory would ever include those, of course.
(3) She had an intelligent secretary too.
(4) She was a good detective and a good woman.
(5) What she lacked in possessions was more than made up by a natural shrewdness.

Instructions for questions 60 - 62:

The passage given below is followed by a set of questions. Choose the most appropriate answer to each question.

The difficulties historians face in establishing cause-and-effect relations in the history of human societies are broadly similar to the difficulties facing astronomers, climatologists, ecologists, evolutionary biologists, geologists, and palaeontologists. To varying degrees each of these fields is plagued by the impossibility of performing replicated, controlled experimental interventions, the complexity arising from enormous numbers of variables, the resulting uniqueness of each system, the consequent impossibility of formulating universal laws, and the difficulties of predicting emergent properties and future behaviour. Prediction in history, as in other historical sciences, is most feasible on large spatial scales and over long times, when the unique features of millions of small-scale brief events become averaged out. Just as I could predict the sex ratio of the next 1,000 newborns but not the sexes of my own two children, the historian can recognize factors that made inevitable the broad outcome of the collision between American and Eurasian societies after 13,000 years of separate developments, but not the outcome of the 1960 U.S. presidential election. The

details of which candidate said what during a single televised debate in October 1960 could have given the electoral victory to Nixon instead of to Kennedy, but no details of who said what could have blocked the European conquest of Native Americans.

How can students of human history profit from the experience of scientists in other historical sciences? A methodology that has proved useful involves the comparative method and so-called natural experiments. While neither astronomers studying galaxy formation nor human historians can manipulate their systems in controlled laboratory experiments, they both can take advantage of natural experiments, by comparing systems differing in the presence or absence (or in the strong or weak effect) of some putative causative factor. For example, epidemiologists, forbidden to feed large amounts of salt to people experimentally, have still been able to identify effects of high salt intake by comparing groups of humans who already differ greatly in their salt intake; and cultural anthropologists, unable to provide human groups experimentally with varying resource abundances for many centuries, still study long-term effects of resource abundance on human societies by comparing recent Polynesian populations living on islands differing naturally in resource abundance.

The student of human history can draw on many more natural experiments than just comparisons among the five inhabited continents. Comparisons can also utilize large islands that have developed complex societies in a considerable degree of isolation (such as Japan, Madagascar, Native American Hispaniola, New Guinea, Hawaii, and many others), as well as societies on hundreds of smaller islands and regional societies within each of the continents. Natural experiments in any field, whether in ecology or human history, are inherently open to potential methodological criticisms. Those include confounding effects of natural variation in additional variables besides the one of interest, as well as problems in inferring chains of causation from observed correlations between variables. Such methodological problems have been discussed in great detail for some of the historical sciences. In particular, epidemiology, the science of drawing inferences about human diseases by comparing groups of people (often by retrospective historical studies), has for a long time successfully employed formalized procedures for dealing with problems similar to those facing historians of human societies.

In short, I acknowledge that it is much more difficult to understand human history than to understand problems in fields of science where history is unimportant and where fewer individual variables operate. Nevertheless, successful methodologies for analyzing historical problems have been worked out in several fields. As a result, the histories of dinosaurs, nebulae, and glaciers are generally acknowledged to belong to fields of science rather than to the humanities.

60. Why do islands with considerable degree of isolation provide valuable insights into human history?

(1) Isolated islands may evolve differently and this difference is of interest to us.
(2) Isolated islands increase the number of observations available to historians.
(3) Isolated islands, differing in their endowments and size may evolve differently and this difference can be attributed to their endowments and size.
(4) Isolated islands, differing in their endowments and size, provide a good comparison to large islands such as Eurasia, Africa, Americas and Australia.
(5) Isolated islands, in so far as they are inhabited, arouse curiosity about how human beings evolved there.

61. According to the author, why is prediction difficult in history?

(1) Historical explanations are usually broad so that no prediction is possible.
(2) Historical outcomes depend upon a large number of factors and hence prediction is difficult for each case.
(3) Historical sciences, by their very nature, are not interested in a multitude of minor factors, which might be important in a specific historical outcome.
(4) Historians are interested in evolution of human history and hence are only interested in long-term predictions.
(5) Historical sciences suffer from the inability to conduct controlled experiments and

therefore have explanations based on a few long-term factors.

62. According to the author, which of the following statements would be true?

(1) Students of history are missing significant opportunities by not conducting any natural experiments.
(2) Complex societies inhabiting large islands provide great opportunities for natural experiments.
(3) Students of history are missing significant opportunities by not studying an adequate variety of natural experiments.
(4) A unique problem faced by historians is their inability to establish cause and effect relationships.
(5) Cultural anthropologists have overcome the problem of confounding variables through natural experiments.

Instructions for questions 63 - 65:

In each question, there are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are correct in terms of grammar and usage. Then, choose the most appropriate option.

63.

A. When I returned to home, I began to read
B. everything I could get my hand on about Israel.
C. That same year Israel's Jewish Agency sent
D. a Shaliach a sort of recruiter to Minneapolis.
E. I became one of his most active devotees.

(1) C and E (2) C only (3) E only
(4) B, C and E (5) C, D and E

64.

A. So once an economy is actually in recession,
B. The authorities can, in principle, move the economy
C. Out of slump- assuming hypothetically
D. That they know how to- by a temporary stimuli.
E. In the longer term, however, such policies have no affect on the overall behaviour of the economy.

(1) A, B and E (2) B, C and E (2) C and D
(4) E only (5) B only

65.

A. It is sometimes told that democratic
B. government originated in the city-states
C. of ancient Greece. Democratic ideals have been handed to us from that time.
D. In truth, however, this is an unhelpful assertion.
E. The Greeks gave us the word, hence did not provide us with a model.

(1) A, B and D (2) B, C and D (3) B and D
(4) B only (5) D only

Instructions for questions 66 - 68:

The passage given below is followed by a set of questions. Choose the most appropriate answer to each question.

Human Biology does nothing to structure human society. Age may enfeeble us all, but cultures vary considerably in the prestige and power they accord to the elderly. Giving birth is a necessary condition for being a mother, but it is not sufficient. We expect mothers to behave in maternal ways and to display appropriately maternal sentiments. We prescribe a clutch of norms or rules that govern the role of a mother. That the social role is independent of the biological base can be demonstrated by going back three sentences. Giving birth is certainly not sufficient to be a mother but, as adoption and fostering show, it is not even necessary!

The fine detail of what is expected of a mother or a father or a dutiful son differs from culture to culture, but everywhere behaviour is coordinated by the reciprocal nature of roles. Husbands and wives, parents and children, employers and employees, waiters and customers, teachers and pupils, warlords and followers; each makes sense only in its relation to the other. The term 'role' is an appropriate one, because the metaphor of an actor in a play neatly expresses the rule-governed nature or scripted nature of much of social life and the sense that society is a joint production. Social life occurs only because people play their parts (and that is as true for war and conflicts as for peace and love) and those parts make sense only in the context of the overall show. The

drama metaphor also reminds us of the artistic licence available to the players. We can play a part straight or, as the following from J.P. Sartre conveys, we can ham it up.

Let us consider this waiter in the cafe. His movement is quick and forward, a little too precise, a little too rapid. He comes towards the patrons with a step a little too quick. He bends forward a little too eagerly; his voice, his eyes express an interest a little too solicitous for the order of the customer. Finally there he returns, trying to imitate in his walk the inflexible stiffness of some kind of automaton while carrying his tray with the recklessness of a tightrope-walker....All his behaviour seems to us a game....But what is he playing? We need not watch long before we can explain it: he is playing at being a waiter in a cafe.

The American sociologist Erving Goffman built an influential body of social analysis on elaborations of the metaphor of social life as drama. Perhaps his most telling point was that it is only through acting out a part that we express character. It is not enough to be evil or virtuous; we have to be seen to be evil or virtuous.

There is distinction between the roles we play and some underlying self. Here we might note that some roles are more absorbing than others. We would not be surprised by the waitress who plays the part in such a way as to signal to us that she is much more than her occupation. We would be surprised and offended by the father who played his part 'tongue in cheek'. Some roles are broader and more far-reaching than others. Describing someone as a clergyman or faith healer would say far more about that person than describing someone as a bus driver.

66. What is the thematic highlight of this passage?

(1) In the absence of strong biological linkages, reciprocal roles provide the mechanism for coordinating human behaviour.
(2) In the absence of reciprocal roles, biological linkages provide the mechanism for coordinating human behaviour.
(3) Human behaviour is independent of biological linkages and reciprocal roles.
(4) Human behaviour depends on biological linkages and reciprocal roles.
(5) Reciprocal roles determine normative human behaviour in society.

67. Which of the following would have been true if biological linkages structured human society?

(1) The role of mother would have been defined through her reciprocal relationship with her children.
(2) We would not have been offended by the father playing his role 'tongue in cheek'.
(3) Women would have adopted and fostered children rather than giving birth to them.
(4) Even if warlords were physically weaker than their followers, they would still dominate them.
(5) Waiters would have stronger motivation to serve their customers.

68. It has been claimed in the passage that "some roles are more absorbing than others". According to the passage, which of the following seem(s) appropriate reason(s) for such a claim?

A. Some roles carry great expectations from the society preventing manifestation of the true self.
B. Society ascribes so much importance to some roles that the conception of self may get aligned with the roles being performed.
C. Some roles require development of skill and expertise leaving little time for manifestation of self.

(1) A only (2) B only (3) C only
(4) A and B (5) B and C

Instructions for questions 69 - 72:

In each question, there are five sentences/paragraphs. The sentence/ paragraph labelled A is in its correct place. The four that follow are labelled B, C, D and E, and need to be arranged in the logical order to form a coherent paragraph/passage. From the given options, choose the most appropriate option.

69.

A. In America, highly educated women, who are in stronger position in the labour market than less qualified ones, have higher rates of marriage than other groups.
B. Some work supports the Becker thesis, and some appears to contradict it.
C. And, as with crime, it is equally inconclusive.

D. But regardless of the conclusion of any particular piece of work, it is hard to establish convincing connections between family changes and economic factors using conventional approaches.

E. Indeed, just as with crime, an enormous academic literature exists on the validity of the pure economic approach to the evolution of family structures.

(1) BCDE (2) DBEC (3) BDCE
(4) ECBD (5) EBCD

70.

A. Personal experience of mothering and motherhood are largely framed in relation to two discernible or "official" discourses: the "medical discourse and natural childbirth discourse". Both of these tend to focus on the "optimistic stories" of birth and mothering and underpin stereotypes of the "godmother".

B. At the same time, the need for medical expert guidance is also a feature for contemporary reproduction and motherhood.
But constructions of good mothering have not always been so conceived- and in different contexts may exist in parallel to other equally dominant discourses.

C. Similarly, historical work has shown how what are now taken-for-granted aspects of reproduction and mothering practices result from contemporary "pseudoscientific directives" and "managed constructs". These changes have led to a reframing of modern discourses that pattern pregnancy and motherhood leading to an acceptance of the need for greater expert management.

D. The contrasting, overlapping and ambiguous strands within these frameworks focus to varying degrees on a woman's biological tie to her child and predisposition to instinctively know and be able to care for her child.

E. In addition, a third, "unofficial popular discourse" comprising "old wives" tales and based on maternal experiences of childbirth has also been noted. These discourses have also been acknowledged in work exploring the experiences of those who apparently do not "conform" to conventional stereotypes of the "good mother".

(1) EDBC (2) BCED (3) DBCE
(4) EDCB (5) BCDE

71.

A. Indonesia has experienced dramatic shifts in its formal governance arrangements since the fall of President Soeharto and the close of his centralized, authoritarian "New Order" regime in 1997.

B. The political system has taken its place in the nearly 10 years since *Reformasi* began. It has featured the active contest for political office among a proliferation of parties at central, provincial and district levels; direct elections for the presidency (since 2004); and radical changes in centre- local government relations towards administrative, fiscal, and political decentralization.

C. The mass media, once tidily under Soeharto's thumb, has experienced significant liberalization as has the legal basis for non-governmental organizations, including many dedicated to such controversial issues as corruption control and human rights.

D. Such developments are seen optimistically by a number of donors and some external analysts, who interpret them as signs of Indonesia's political normalization.

E. A different group of analysts paint a picture in which the institutional forms have changed, but power relations have not. Vedi Hadiz argues that Indonesia's "democratic transition" has been anything but linear.

(1) BDEC (2) CBDE (3) CEBD
(4) DEBC (5) BCDE

72.

A. I had six thousand acres of land, and had thus got much spare land besides the coffee plantation. Part of the farm was native forest, and about one thousand acres were squatters' land, what [the Kikuyu] called their *shambas.*

B. The squatters' land was more intensely alive than the rest of the farm, and was changing with the seasons the year round. The maize grew up higher than your head as you walked

on the narrow hard-trampled footpaths in between the tall green rustling regiments.

C. The squatters are natives, who with their families hold a few acres on a white man's farm, and in return have to work for him a certain number of days in the year. My squatters, I think, saw the relationship in a different light, for many of them were born on the farm, and their fathers before them, and they very likely regarded me as a sort of superior squatter on their estates.

D. The Kikuyu also grew the sweet potatoes that have a vine like leaf and spread over the ground like a dense entangled mat, and many varieties of big yellow and green speckled pumpkins.

E. The beans ripened in the fields, were gathered and thrashed by the women, and the maize stalk and coffee pods were collected and burned, so that in certain seasons thin blue columns of smoke rose here and there all over the farm.

(1) CBDE (2) BCDE (3) CBED
(4) DBCE (5) EDBC

Instructions for questions 73 - 75:

The passage given below is followed by a set of questions. Choose the most appropriate answer to each question.

Every civilized society lives and thrives on a silent but profound agreement as to what is to be accepted as the valid mould of experience. Civilization is a complex system of dams, dykes, and canals warding off, directing, and articulating the influx of the surrounding fluid element; a fertile fenland, elaborately drained and protected from the high tides of chaotic, unexercised, and inarticulate experience. In such a culture, stable and sure of itself within the frontiers of 'naturalized' experience, the arts wield their creative power not so much in width as in depth. They do not create new experience, but deepen and purify the old. Their works do not differ from one another like a new horizon from a new horizon, but like a madonna from a madonna.

The periods of art which are most vigorous in creative passion seem to occur when the established pattern of experience loosens its rigidity without as yet losing its force. Such a period was the Renaissance, and Shakespeare its poetic consummation. Then it was as though the discipline of the old order gave depth to the excitement of the breaking away, the depth of job and tragedy, of incomparable conquests and irredeemable losses. Adventurers of experience set out as though in lifeboats to rescue and bring back to the shore treasures of knowing and feeling which the old order had left floating on the high seas. The works of the early Renaissance and the poetry of Shakespeare vibrate with the compassion for live experience in danger of dying from exposure and neglect. In this compassion was the creative genius of the age. Yet, it was a genius of courage, not of desperate audacity. For, however elusively, it still knew of harbours and anchors, of homes to which to return, and of barns in which to store the harvest. The exploring spirit of art was in the depths of its consciousness still aware of a scheme of things into which to fit its exploits and creations.

But the more this scheme of things loses its stability, the more boundless and uncharted appears the ocean of potential exploration. In the blank confusion of infinite potentialities flotsam of significance gets attached to jetsam of experience; for everything is sea, everything is at sea -

.... The sea is all about us;
The sea is the land's edge also, the granite
Into which it reaches, the beaches where it tosses
Its hints of earlier and other creation...

- and Rilke tells a story in which, as in T.S. Eliot's poem, it is again the sea and the distance of 'other creation' that becomes the image of the poet's reality. A rowing boat sets out on a difficult passage. The oarsmen labour in exact rhythm. There is no sign yet of the destination. Suddenly a man, seemingly idle, breaks out into song. And if the labour of the oarsmen meaninglessly defeats the real resistance of the real waves, it is the idle single who magically conquers the despair of apparent aimlessness. While the people next to him try to come to grips with the element that is next to them, his voice seems to bind the boat to the farthest distance so that the farthest distance draws it towards itself. 'I don't know why and how,' is Rilke's conclusion, 'but suddenly I understood the situation of the poet, his place and function in this age. It does not matter if one denies him every place- except this one. There one must tolerate him.'

73. In the passage, the expression "like a madonna from a madonna" alludes to

(1) The difference arising as a consequence of artistic license.
(2) The difference between two artistic interpretations.
(3) The difference between 'life' and 'interpretation of life'.
(4) The difference between 'width' and 'depth' of creative power.
(5) The difference between the legendary character and the modern day singer.

74. The sea and 'other creation' leads Rilke to

(1) Define the place of the poet in his culture.
(2) Reflect on the role of the oarsman and the singer.
(3) Muse on artistic labour and its aimlessness.
(4) Understand the elements that one has to deal with.
(5) Delve into natural experience and real waves.

75. According to the passage, the term "adventurers of experience" refers to

(1) Poets and artists who are driven by courage.
(2) Poets and artists who create their own genre.
(3) Poets and artists of the Renaissance.
(4) Poets and artists who revitalize and enrich the past for us.
(5) Poets and artists who delve in flotsam and jetsam in sea.

Answer Key

SECTION I			
Q.	**Ans.**	**Q.**	**Ans.**
1	**3**	16	**3**
2	**2**	17	**1**
3	**3**	18	**1**
4	**4**	19	**2**
5	**4**	20	**3**
6	**3**	21	**5**
7	**2**	22	**4**
8	**4**	23	**2**
9	**2**	24	**5**
10	**5**	25	**1**
11	**1**		
12	**2**		
13	**4**		
14	**2**		
15	**4**		

SECTION II			
Q.	**Ans.**	**Q.**	**Ans.**
26	**5**	41	**1**
27	**1**	42	**4**
28	**4**	43	**2**
29	**3**	44	**3**
30	**1**	45	**2**
31	**5**	46	**4**
32	**2**	47	**5**
33	**3**	48	**1**
34	**2**	49	**4**
35	**3**	50	**5**
36	**1**		
37	**5**		
38	**2**		
39	**4**		
40	**3**		

SECTION III			
Q.	**Ans.**	**Q.**	**Ans.**
51	**4**	66	**5**
52	**5**	67	**2**
53	**2**	68	**4**
54	**4**	69	**4**
55	**3**	70	**1**
56	**5**	71	**5**
57	**5**	72	**3**
58	**1**	73	**2**
59	**2**	74	**1**
60	**3**	75	**4**
61	**2**		
62	**3**		
63	**1**		
64	**5**		
65	**3**		

A5

PREVIOUS CAT QUESTION PAPER

CAT 2008

Before the Test:

1. DO NOT REMOVE THE SEAL OF THIS BOOKLET UNTIL THE SIGNAL TO START IS GIVEN.
2. Keep only a pencil, eraser and sharpener with you. DO NOT KEEP with you books, rulers, slide rules, drawing instruments, calculators (including watch calculators), pagers, cellular phones, stop watches or any other device or loose paper. These should be left at a place indicated by the invigilator.
3. Use only HB pencil to fill in the Answer Sheet.
4. Enter in your Answer Sheet: (a) in Box 3, the Test Form Number that appears at the bottom of this page, (b) in Box 4, the Test Booklet Serial Number that appears at the top of this page.
5. Ensure that your personal data have been entered correctly on Side - II of the Answer Sheet.
6. Ensure that you have entered your 8-digit Test Registration Number in Box 2 of the Answer Sheet correctly. Start entering the number from the leftmost cell, leaving the last three cells blank.

At the start of the Test:

1. As soon as the signal to start is given, open the Test Booklet.
2. This Test Booklet contains 22 pages, including the blank ones. Immediately after opening the Test Booklet, verify that all the pages are printed properly and are in order. If there is a problem with your Test Booklet, immediately inform the invigilator. You will be provided with a replacement.

How to answer:

1. This test contains 90 questions in three sections. **There are 25 questions in Section I, 25 questions in Section II and 40 questions in Section III**. You have two and half hours to complete the test. In distributing the time over the three sections, please bear in mind that you need to demonstrate your competence in all three sections.
2. Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles on the Answer Sheet. Each question has only one correct answer.
3. **All questions carry 4 marks each. For a wrong answer you will lose one-fourth of the marks allotted to the question.**
4. Do your rough work only on the Test Booklet and NOT on the Answer Sheet.
5. Follow the instructions of the invigilator. Students found violating the instructions will be disqualified.

After the Test:

1. At the end of the test, remain seated. The invigilator will collect the Answer Sheet from your seat. Do not leave the hall until the invigilator announces "You may leave now". The invigilator will make this announcement only after collecting the Answer Sheets from all the students in the room.
2. You may retain this Test Booklet with you.

Test Form Number: 111

Section I

1. A shop stores x kg of rice. The first customer buys half this amount plus half a kg of rice. The second customer buys half the remaining amount plus half a kg of rice. Then the third customer also buys half the remaining amount plus half a kg of rice. Thereafter, no rice is left in the shop. Which of the following best describes the value of x?

(1) $2 \le x \le 6$ (2) $5 \le x \le 8$
(3) $9 \le x \le 12$ (4) $11 \le x \le 14$
(5) $13 \le x \le 18$

Answer questions 2 and 3 based on the following information.

Let $f(x) = ax^2 + bx + c$, where a, b and c are certain constants and $a \neq 0$. It is known that $f(5) = -3f(2)$ and that 3 is a root of $f(x) = 0$.

2. What is the other root of $f(x) = 0$?

(1) –7 (2) –4 (3) 2
(4) 6 (5) Cannot be determined

3. What is the value of $a + b + c$?

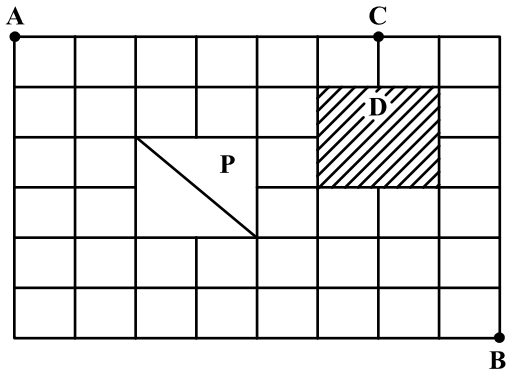
(1) 9 (2) 14 (3) 13
(4) 37 (5) Cannot be determined

4. The number of common terms in the two sequences 17, 21, 25, … , 417 and 16, 21, 26, … , 466 is

(1) 78 (2) 19 (3) 20
(4) 77 (5) 22

Answer questions 5 and 6 based on the following information.

The figure shows the plan of a town. The streets are at right angles to each other. A rectangular park (P) is situated inside the town with a diagonal road running through it. There is also a prohibited region (D) in the town.



5. Neelam rides her bicycle from her house at A to her office at B, taking the shortest path. Then the number of possible shortest paths that she can choose is

(1) 60 (2) 75 (3) 45
(4) 90 (5) 72

6. Neelam rides her bicycle from her house at A to her club at C, via B taking the shortest path. Then the number of possible shortest paths that she can choose is

(1) 1170 (2) 630 (3) 792
(4) 1200 (5) 936

7. Let $f(x)$ be a function satisfying $f(x)\, f(y) = f(xy)$ for all real x, y.

If $f(2) = 4$, then what is the value of $f\left(\frac{1}{2}\right)$?

(1) 0 (2) $\frac{1}{4}$ (3) $\frac{1}{2}$ (4) 1

(5) Cannot be determined

8. The integers 1, 2… 40 are written on a blackboard. The following operation is then repeated 39 times: In each repetition, any two numbers, say a and b, currently on the blackboard are erased and a new number $a + b - 1$ is written. What will be the number left on the board at the end?

(1) 820 (2) 821 (3) 781 (4) 819 (5) 780

9. Suppose, the seed of any positive integer n is defined as follows:
seed(n) = n, if $n < 10$
= seed($s(n)$), otherwise,

where $s(n)$ indicates the sum of digits of n. For example,
seed(7) = 7, seed(248) = seed(2 + 4 + 8)
= seed(14) = seed(1 + 4) = seed(5) = 5 etc.
How many positive integers n, such that $n < 500$, will have seed(n) = 9?

(1) 39 (2) 72 (3) 81 (4) 108 (5) 55

10. In a triangle ABC, the lengths of the sides AB and AC equal 17.5 cm and 9 cm respectively. Let D be a point on the line segment BC such that AD is perpendicular to BC. If AD = 3 cm, then what is the radius (in cm) of the circle circumscribing the triangle ABC?

(1) 17.05 (2) 27.85 (3) 22.45
(4) 32.25 (5) 26.25

11. What are the last two digits of 7^{2008}?

(1) 21 (2) 61 (3) 01 (4) 41 (5) 81

12. If the roots of the equation $x^3 - ax^2 + bx - c = 0$ are three consecutive integers, then what is the smallest possible value of b?

(1) $\frac{-1}{\sqrt{3}}$ (2) -1 (3)0 (4)1 (5) $\frac{1}{\sqrt{3}}$

13. Consider obtuse-angled triangles with sides 8 cm, 15 cm and x cm. If x is an integer, then how many such triangles exist?

(1) 5 (2) 21 (3) 10 (4) 15 (5) 14

14. How many integers, greater than 999 but not greater than 4000, can be formed with the digits 0, 1, 2, 3 and 4, if repetition of digits is allowed?

(1) 499 (2) 500 (3) 375 (4) 376 (5) 501

15. What is the number of distinct terms in the expansion of $(a + b + c)^{20}$?

(1) 231 (2) 253 (3) 242 (4) 210 (5) 228

16. Consider a square ABCD with midpoints E, F, G, H of AB, BC, CD and DA respectively. Let L denote the line passing through F and H. Consider points P and Q, on L and inside ABCD, such that the angles APD and BQC both equal 120°. What is the ratio of the area of ABQCDP to the remaining area inside ABCD?

(1) $\frac{4\sqrt{2}}{3}$ (2) $2 + \sqrt{3}$

(3) $\frac{10 - 3\sqrt{3}}{9}$ (4) $1 + \frac{1}{\sqrt{3}}$

(5) $2\sqrt{3} - 1$

17. Three consecutive positive integers are raised to the first, second and third powers respectively and then added. The sum so obtained is a perfect square whose square root equals the total of the three original integers. Which of the following best describes the minimum, say m, of these three integers?

(1) $1 \le m \le 3$ (2) $4 \le m \le 6$
(3) $7 \le m \le 9$ (4) $10 \le m \le 12$
(5) $13 \le m \le 15$

18. Find the sum

$$\sqrt{1 + \frac{1}{1^2} + \frac{1}{2^2}} + \sqrt{1 + \frac{1}{2^2} + \frac{1}{3^2}} + \ldots\ldots + \sqrt{1 + \frac{1}{2007^2} + \frac{1}{2008^2}}$$

(1) $2008 - \frac{1}{2008}$ (2) $2007 - \frac{1}{2007}$

(3) $2007 - \frac{1}{2008}$ (4) $2008 - \frac{1}{2007}$

(5) $2008 - \frac{1}{2009}$

19. Two circles, both of radii 1 cm, intersect such that the circumference of each one passes through the centre of the circle of the other. What is the area (in sq cm) of the intersecting region?

(1) $\frac{\pi}{3} - \frac{\sqrt{3}}{4}$ (2) $\frac{2\pi}{3} + \frac{\sqrt{3}}{2}$

(3) $\frac{4\pi}{3} - \frac{\sqrt{3}}{2}$ (4) $\frac{4\pi}{3} + \frac{\sqrt{3}}{2}$

(5) $\frac{2\pi}{3} - \frac{\sqrt{3}}{2}$

20. Rahim plans to drive from city A to station C, at the speed of 70 km per hour, to catch a train arriving there from B. He must reach C at least 15 minutes before the arrival of the train. The train leaves B, located 500 km south of A, at 8:00 am and travels at a speed of 50 km per hour. It is known that C is located between west and northwest of B, with BC at 60° to AB. Also, C is located between south and southwest of A with AC at 30° to AB. The latest time by which Rahim must leave A and still catch the train is closest to.

(1) 6:15 a.m. (2) 6:30 a.m.
(3) 6:45 a.m. (4) 7:00 a.m.
(5) 7:15 a.m.

21. Consider a right circular cone of base radius 4 cm and height 10 cm. A cylinder is to be placed inside the cone with one of the flat surface resting on the base of the cone. Find the largest possible total surface area (in sq. cm) of the cylinder.

(1) $\frac{10\pi}{3}$ (2) $\frac{80\pi}{3}$ (3) $\frac{120\pi}{7}$
(4) $\frac{130\pi}{9}$ (5) $\frac{110\pi}{7}$

Answer questions 22 and 23 based on the following information:

Five horses, Red, White, Grey, Black and Spotted participated in a race. As per the rules of the race, the persons betting on the winning horse get four times the bet amount and those betting on the horse that came in second get thrice the bet amount. Moreover, the bet amount is returned to those betting on the horse that came in third, and the rest lose the bet amount. Raju bets Rs. 3000, Rs. 2000 Rs. 1000 on Red, White and Black horses respectively and ends up with no profit and no loss.

22. Which of the following cannot be true?

(1) At least two horses finished before Spotted
(2) Red finished last
(3) There were three horses between Black and Spotted
(4) There were three horses between White and Red
(5) Grey came in second

23. Suppose, in addition, it is known that Grey came in fourth. Then which of the following cannot be true?

(1) Spotted came in first
(2) Red finished last
(3) White came in second
(4) Black came in second
(5) There was one horse between Black and White

Answer questions 24 and 25 based on the following instructions and information:

Each question is followed by two statements, A and B.
Mark (1) if the question can be answered by using statement A alone but not by using statement B alone.
Mark (2) if the question can be answered by using statement B alone but not by using statement A alone.
Mark (3) if the question can be answered by using either of the statements alone.
Mark (4) if the question can be answered by using both the statements together but not by either of the statements alone.
Mark (5) if the question cannot be answered on the basis of the two statements.

In a single elimination tournament, any player is eliminated with a single loss. The tournament is played in multiple rounds subject to the following rules:

a. If the number of players, say n, in any round is even, then the players are grouped into $n/2$ pairs. The players in each pair play a match against each other and the winner moves on to the next round.
b. If the number of players, say n, in any round is odd, then one of them is given a bye, that is, he automatically moves on to the next round. The remaining $(n - 1)$ players are grouped into $(n - 1)/2$ pairs. The players in each pair play a match against each other and the winner moves on to the next round. No player gets more than one bye in the entire tournament.

Thus, if n is even, then $n/2$ players move on to the next round while if n is odd, then $(n + 1)/2$ players move on to the next round. The process is continued till the final round, which obviously is played between two players. The winner in the final round is the champion of the tournament.

24. What is the number of matches played by the champion?

A. The entry list for the tournament consists of 83 players.
B. The champion received one bye.

25. If the number of players, say n, in the first round was between 65 and 128, then what is the exact value of n?

A. Exactly one player received a bye in the entire tournament.
B. One player received a bye while moving on to the fourth round from the third round

Section II

Answer questions 26 to 28 based on the following information:

For admission to various affiliated colleges, a university conducts a written test with four different sections, each with a maximum of 50 marks. The following table gives the aggregate as well as the sectional cut-off marks fixed by six different colleges affiliated to the university. A student will get admission only if he/she gets marks greater than or equal to the cut-off marks in each of the sections and his/her aggregate marks are at least equal to the aggregate cut-off marks as specified by the college.

	Sectional Cut-off Marks				Aggregate Cut-off Marks
	Section A	Section B	Section C	Section D	
College 1	42	42	42		176
College 2		45	45		175
College 3			46		171
College 4	43			45	178
College 5	45		43		180
College 6		41		44	176

26. Aditya did not get a call from even a single college. What could be the maximum aggregate marks obtained by him?

(1) 181 (2) 176 (3) 184 (4) 196 (5) 190

27. Bhama got calls from all colleges. What could be the minimum aggregate marks obtained by her?

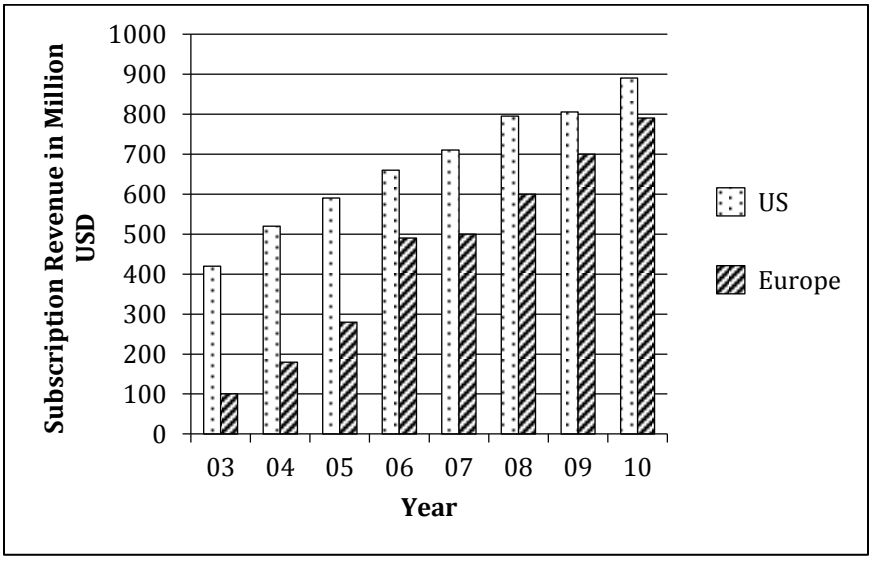
(1) 180 (2) 181 (3) 196 (4) 176 (5) 184

28. Charlie got calls from two colleges. What could be the minimum marks obtained by him in a section?

(1) 0 (2) 21 (3) 25 (4) 35 (5) 41

Answer questions 29 to 32 based on the following information:

The bar chart below shows the revenue received, in million US Dollars (USD), from subscribers to a particular Internet service. The data covers the period 2003 to 2007 for the United States (US) and Europe. The bar chart also shows the estimated revenues from subscription to this service for the period 2008 to 2010.



29. While the subscription in Europe has been growing steadily towards that of the US, the growth rate in Europe seems to be declining. Which of the following is closest to the percent change in growth rate of 2007 (over 2006) relative to the growth rate of 2005 (over 2004)?

(1) 17 (2) 20 (3) 35 (4) 60 (5) 100

30. The difference between the estimated subscription in Europe in 2008 and what it would have been if it were computed using the percentage growth rate of 2007 (over 2006), is closest to:

(1) 50 (2) 80 (3) 20 (4) 10 (5) 0

31. In 2003, sixty percent of subscribers in Europe were men. Given that woman subscribers increase at the rate of 10 percent per annum and men at the rate of 5 percent per annum, what is the approximate percentage growth of subscribers between 2003 and 2010 in Europe? The subscription prices are volatile and may change each year.

(1) 62 (2) 15 (3) 78 (4) 84 (5) 50

32. Consider the annual percent change in the gap between subscription revenues in the US and Europe. What is the year in which the absolute value of this change is the highest?

(1) 03-04 (2) 05-06 (3) 06-07 (4) 08-09 (5) 09-10

Answer the questions 33 to 35 based on the following information:

There are 100 employees in an organization across five departments. The following table gives the department-wise distribution of average age, average basic pay and allowances. The gross pay of an employee is the sum of his/her basic pay and allowances.

There are limited numbers of employees considered for transfer/promotion across departments. Whenever a person is transferred/promoted from a department of lower average age to a department of higher average age, he/she will get an additional allowance of 10% of basic pay over and above his/her current allowance. There will not be any change in pay structure if a person is transferred/promoted from a department with higher average age to a department with lower average age.

Department	Number of Employees	Average Age (Years)	Average Basic Pay (Rupees)	Allowances (% of Basic Pay)
HR	5	45	5000	70
Marketing	30	35	6000	80
Finance	20	30	6500	60
Business Development	35	42	7500	75
Maintenance	10	35	5500	50

33. There was a mutual transfer of an employee between Marketing and Finance departments and transfer of one employee from Marketing to HR. As a result, the average age of Finance department increased by one year and that of Marketing department remained the same. What is the new average age of HR department?

(1) 30 (2) 35 (3) 40 (4) 45
(5) Cannot be determined

34. What is the approximate percentage change in the average gross pay of the HR department due to transfer of a 40-year old person with basic pay of Rs. 8000 from the Marketing department?

(1) 9% (2) 11% (3) 13% (4) 15% (5) 17%

35. If two employees (each with a basic pay of Rs. 6000) are transferred from Maintenance department to HR department and one person (with a basic pay of Rs. 8000) was transferred from Marketing department to HR department, what will be the percentage change in average basic pay of HR department?

(1) 10.5% (2) 12.5% (3) 15% (4) 30% (5) 40%

Answer questions 36 to 40 based on the following information:

Abdul, Bikram and Chetan are three professional traders who trade in shares of a company XYZ Ltd. Abdul follows the strategy of buying at the opening of the day at 10 am and selling the whole lot at the close of the day at 3 pm. Bikram follows the strategy of buying at hourly intervals: 10 am , 11 am, 12 noon, 1 pm and 2 pm, and selling the whole lot at the close of the day. Further, he buys an equal number of shares in each purchase. Chetan follows a similar pattern as Bikram but his strategy is somewhat different. Chetan's total investment amount is divided equally among his purchases. The profit or loss made by each investor is the difference between the sale value at the close of the day less the investment in purchase. The "return" for each investor is defined as the ratio of the profit or loss to the investment amount expressed as a percentage.

36. On a "boom" day the price of XYZ Ltd. keeps rising throughout the day and peaks at the close of the day. Which trader got the minimum return on that day?

(1) Bikram (2) Chetan
(3) Abdul (4) Abdul or Chetan
(5) Cannot be determined

37. On a day of fluctuating market prices, the share price of XYZ Ltd. ends with a gain, i.e., it is higher at the close of the day compared to the opening value. Which trader got the maximum return on that day?

(1) Bikram
(2) Chetan
(3) Abdul
(4) Bikram or Chetan
(5) Cannot be determined

38. Which one of the following statements is always true?

(1) Abdul will not be the one with the minimum return
(2) Return for Chetan will be higher than that of Bikram
(3) Return for Bikram will be higher than that of Chetan
(4) Return for Chetan cannot be higher than that of Abdul
(5) none of the above

39. One day, two other traders, Dane and Emily joined Abdul, Bikram and Chetan for trading in the shares of XYZ Ltd. Dane followed a strategy of buying equal numbers of shares at 10 am, 11 am and 12 noon, and selling the same numbers at 1 pm, 2 pm and 3 pm. Emily, on the other hand, followed the strategy of buying shares using all her money at 10 am and selling all of them at 12 noon and again buying the shares for all the money at 1 pm and again selling all of them at the close of the day at 3 pm. At the close of the day the following was observed:

i. Abdul lost money in the transactions.
ii. Both Dane and Emily made profits.
iii. There was an increase in share price during the closing hour compared to the price at 2 pm.
iv. Share price at 12 noon was lower than the opening price.

Which of the following is necessarily false?

(1) Share price was at its lowest at 2 pm
(2) Share price was at its lowest at 11 am
(3) Share price at 1 pm was higher than the share price at 2 pm
(4) Share price at 1 pm was higher than the share price at 12 noon
(5) None of the above

40. Share price was at its highest at
Note: Use data from the previous question.

(1) 10 am (2) 11 am (3) 12 noon
(4) 1 pm (5) Cannot be determined

Answer questions 41 to 43 based on the following information:

i. There are three houses on each side of the road.
ii. These six houses are labelled as P, Q, R, S, T and U.
iii. The houses are of different colours, namely, Red, Blue, Green, Orange, Yellow and White.
iv. The houses are of different heights.
v. T, the tallest house, is exactly opposite to the Red coloured house.
vi. The shortest house is exactly opposite to the Green coloured house.
vii. U, the Orange coloured house, is located between P and S.
viii. R, the Yellow coloured house, is exactly opposite to P.
ix. Q, the Green coloured house, is exactly opposite to U.
x. P, the White coloured house, is taller than R, but shorter than S and Q.

41. What is the colour of the tallest house?

(1) Red (2) Blue (3) Green
(4) Yellow (5) None of these

42. What is the colour of the house diagonally opposite to the Yellow coloured house?

(1) White (2) Blue (3) Green
(4) Red (5) None of these

43. Which is the second tallest house?

(1) P (2) S (3) Q
(4) R (5) Cannot be determined

Answer questions 44 to 47 based on the following information:

In a sports event, six teams (A, B, C, D, E and F) are competing against each other. Matches are scheduled in two stages. Each team plays three matches in Stage-I and two matches in Stage-II. No team plays against the same team more than once in the event. No ties are permitted in any of the matches. The observations after the completion of Stage-I and Stage-II are as given below.

Stage-I:
- One team won all the three matches.
- Two teams lost all the matches.
- D lost to A but won against C and F.
- E lost to B but won against C and F.
- B lost at least one match.
- F did not play against the top team of Stage-I.

Stage-II:
- The leader of Stage-I lost the next two matches.
- Of the two teams at the bottom after Stage-I, one team won both matches, while the other lost both matches.
- One more team lost both matches in Stage-II.

44. The team(s) with the most wins in the event is (are):

(1) A (2) A & C (3) F
(4) E (5) B & E

45. The two teams that defeated the leader of Stage-I are:

(1) F & D (2) E & F (3) B & D
(4) E & D (5) F & D

46. The only team(s) that won both the matches in Stage-II is (are):

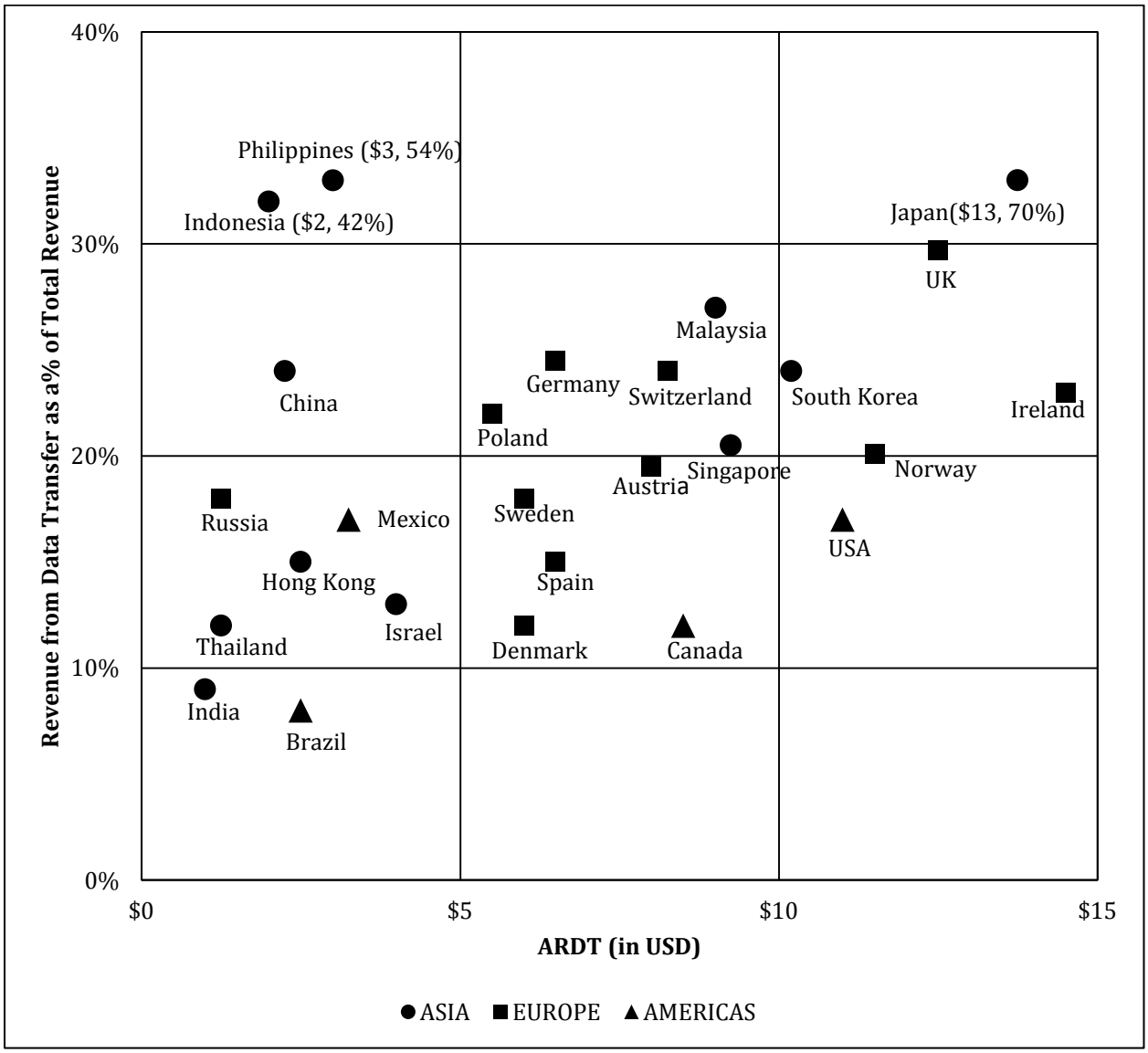
(1) B (2) E & F (3) A, E & F
(4) B, E & F (5) B & F

47. The teams that won exactly two matches in the event are:

(1) A, D & F (2) D & E (3) E & F
(4) D, E & F (5) D & F

Answer questions 48 to 49 based on the following information:

Telecom operators get revenue from transfer of data and voice. Average revenue received from transfer of each unit of data is known as ARDT. In the diagram below, the revenue received from data transfer as percentage of total revenue received and the ARDT in US Dollars (USD) are given for various countries.



48. If the total revenue received is the same for the pairs of countries listed in the choices below, choose the pair that has approximately the same volume of data transfer.

(1) Philippines and Austria (2) Canada and Poland (3) Germany and USA
(4) UK and Spain (5) Denmark and Mexico

49. It was found that the volume of data transfer in India is the same as that of Singapore. Then which of the following statements are true?

(1) Total revenue is the same in both countries
(2) Total revenue in India is about 2 times that of Singapore
(3) Total revenue in India is about 4 times that of Singapore
(4) Total revenue in Singapore is about 2 times that of India

(5) Total revenue in Singapore is about 4 times that of India

50. It is expected that by 2010, revenue from the data transfer as a percentage of total revenue will triple for India and double for Sweden. Assume that in 2010, the total revenue in India is twice that of Sweden and that the volume of data transfer is the same in both the countries. What is the percentage increase of ARDT in India if there is no change in ARDT in Sweden?

(1) 400% (2) 550% (3) 800% (4) 950%
(5) Cannot be determined

Section III

Instructions for questions 51 - 54:

In each question, there are five sentences. Each sentence has a pair of words that are italicized and highlighted. From the italicized and highlighted words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate one.

51. Anita wore a beautiful **broach(A)/brooch(B)** on the lapel of her jacket.
If you want to complain about the amenities in your neighbourhood, please meet your **councillor(A)/counselor(B)**.
I would like your **advice(A)/advise(B)** on which job I should choose.
The last scene provided a **climactic(A)/climatic(B)** ending to the film.
Jeans that **flair(A)/flare(B)** at the bottom are in fashion these days.

(1) BABAA (2) BABAB (3) BAAAB
(4) ABABA (5) BAABA

52. The cake had lots of **currents(A)/currants(B)** and nuts in it.
If you engage in such **exceptional(A)/exceptionable(B)** behaviour, I will be forced to punish you.
He has the same capacity as an adult to **consent(A)/assent(B)** to surgical treatment.
The minister is **obliged(A)/compelled(B)** to report regularly to a parliamentary board.
His analysis of the situation is far too **sanguine(A)/genuine(B)**.

(1) BBABA (2) BBAAA (3) BBBBA
(4) ABBAB (5) BABAB

53. She managed to bite back the **ironic(A)/caustic(B)** retort on the tip of her tongue.
He gave an impassioned and **valid(A)/cogent(B)** plea for judicial reform.
I am not **adverse(A)/averse(B)** to helping out.
The **coupé(A)/coup(B)** broke away as the train climbed the hill.
They heard the bells **peeling(A)/pealing(B)** far and wide.

(1) BBABA (2) BBBAB (3) BAABB
(4) ABBAA (5) BBBBA

54. We were not successful in **defusing(A)/diffusing(B)** the Guru's ideas.
The students **baited(A)/bated(B)** the instructor with irrelevant questions.
The **hoard(A)/horde(B)** rushed into the campus.
The prisoner's **interment(A)/internment(B)** came to an end with his early release.
The hockey team could not deal with his **unsociable(A)/unsocial(B)** tendencies.

(1) BABBA (2) BBABB (3) BABAA
(4) ABBAB (5) AABBA

Instructions for questions 55 - 58:
In each of the following questions there are sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are correct in terms of grammar and usage (including spelling, punctuation and logical consistency). Then, choose the **most appropriate** option.

55.

A. In 1849, a poor Bavarian imigrant named Levi Strauss
B. landed in San Francisco, California,
C. at the invitation of his brother-in-law David Stern
D. owner of dry goods business.
E. This dry goods business would later became known as Levi Strauss & Company.

(1) B only (2) B and C (3) A and B
(4) A only (5) A, B and D

56.

A. In response to the allegations and condemnation pouring in,
B. Nike implemented comprehensive changes in their labour policy.
C. Perhaps sensing the rising tide of global labour concerns,

D. from the public would become a prominent media issue,
E. Nike sought to be a industry leader in employee relations.

(1) D and E (2) D only (3) A and E
(4) A and D (5) B, C and E

57.

A. Charges and counter-charges mean nothing
B. to the few million who have lost their home.
C. The nightmare is far from over, for the government
D. is still unable to reach hundreds who are marooned.
E. The death count have just begun.

(1) A only (2) C only (3) A and C
(4) A, C and D (5) D only

58.

A. I did not know what to make of you.
B. Because you'd lived in India, I associate you more with my parents than with me.
C. And yet you were unlike my cousins in Calcutta, who seem so innocent and obedient when I visited them.
D. You were not curious about me in the least.
E. Although you did make effort to meet me.

(1) A only (2) A and B (3) A and E
(4) D only (5) A and D

Instructions for questions 59 - 62:

Each of the following questions has a sentence with two blanks. Given below each question are five pairs of words. Choose the pair that **best** completes the sentence.

59. The genocides in Bosnia and Rwanda, apart from being mis-described in the most sinister and _____ manner as 'ethnic cleansing', were also blamed, in further hand-washing rhetoric, on something dark and interior to _____ and perpetrators alike.

(1) innovative; communicator
(2) enchanting; leaders
(3) disingenuous; victims
(4) exigent; exploiters
(5) tragic; sufferers

60. As navigators, calendar makers, and other _____ of the night sky accumulated evidence to the contrary, ancient astronomers were forced to _____ that certain bodies might move in circles about points, which in turn moved in circles about the earth.

(1) scrutinizers; believe
(2) observers; agree
(3) scrutinizers; suggest
(4) observers; concede
(5) students; conclude

61. Every human being, after the first few days of his life, is a product of two factors: on the one hand, there is his _____ endowment; and on the other hand, there is the effect of environment, including _____.

(1) constitutional; weather
(2) congenital; education
(3) personal; climate
(4) economic; learning
(5) genetic; pedagogy

62. Exhaustion of natural resources, destruction of individual initiative by governments, control over men's minds by central _____ of education and propaganda are some of the major evils which appear to be on the increase as a result of the impact of science upon minds suited by _____ to an earlier kind of world.

(1) tenets; fixation
(2) aspects; inhibitions
(3) institutions; inhibitions
(4) organs; tradition
(5) departments; repulsion

Instructions for questions 63 - 66:

In each of the questions, a word has been used in sentences in five different ways. Choose the option corresponding to the sentence in which the usage of the word is <u>incorrect or inappropriate.</u>

63. RUN

(1) I must run fast to catch up with him.
(2) Our team scored a goal against the run of play.
(3) You can't run over him like that.

(4) The newly released book is enjoying a popular run.
(5) This film is a run-of-the-mill production.

64. ROUND

(1) The police fired a round of tear gas shells.
(2) The shop is located round the corner.
(3) We took a ride on the merry-go-round.
(4) The doctor is on a hospital round.
(5) I shall proceed further only after you come round to admitting it.

65. BUCKLE

(1) After the long hike our knees were beginning to buckle.
(2) The horse suddenly broke into a buckle.
(3) The accused did not buckle under police interrogation.
(4) Sometimes, an earthquake can make a bridge buckle.
(5) People should learn to buckle up as soon as they get into a car.

66. FILE

(1) You will find the paper in the file under C.
(2) I need to file an insurance claim.
(3) The cadets were marching in a single file.
(4) File your nails before you apply nail polish.
(5) When the parade was on, a soldier broke the file.

Instructions for questions 67 - 70:

Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the **most appropriate** way.

67. Most people at their first consultation take a furtive look at the surgeon's hands in the hope of reassurance. Prospective patients look for delicacy, sensitivity, steadiness, perhaps unblemished pallor. On this basis, Henry Perowne loses a number of cases each year. Generally, he knows it's about to happen before the patient does: the downward glance repeated, the prepared questions beginning to falter, the overemphatic thanks during the retreat to the door. _____

(1) Other people do not communicate due to their poor observation.
(2) Other patients don't like what they see but are ignorant of their right to go elsewhere.
(3) But Perowne himself is not concerned.
(4) But others will take their place, he thought.
(5) These hands are steady enough, but they are large.

68. Trade protectionism, disguised as concern for the climate, is raising its head. Citing competitiveness concerns, powerful industrialized countries are holding out threats of a levy on imports of energy-intensive products from developing countries that refuse to accept their demands. The actual source of protectionist sentiment in the OECD countries is, of course, their current lacklustre economic performance, combined with the challenges posed by the rapid economic rise of China and India- in that order. _____

(1) Climate change is evoked to bring trade protectionism through the back door.
(2) OECD countries are taking refuge in climate change issues to erect trade barriers against these two countries.
(3) Climate change concerns have come as a convenient stick to beat the rising trade power of China and India.
(4) Defenders of the global economic status quo are posing as climate change champions.
(5) Today's climate change champions are the perpetrators of global economic inequity.

69. Mattancherry is Indian Jewry's most famous settlement. Its pretty streets of pastel coloured houses, connected by first-floor passages and home to the last twelve saree-and-sarong-wearing, white-skinned Indian Jews are visited by thousands of tourists each year. Its synagogue, built in 1568, with a floor of blue-and-white Chinese tiles, a carpet given by Haile Selassie and the frosty Yaheh selling tickets at the door, stands as an image of religious tolerance. _____

(1) Mattancherry represents, therefore, the perfect picture of peaceful co-existence.
(2) India's Jews have almost never suffered discrimination, except for European colonizers and each other.

(3) Jews in India were always tolerant.
(4) Religious tolerance has always been only a façade and nothing more.
(5) The pretty pastel streets are, thus, very popular with the tourists.

70. Given the cultural and intellectual interconnections, the question of what is 'Western' and what is 'Eastern' (or 'Indian') is often hard to decide, and the issue can be discussed only in more dialectical terms. The diagnosis of a thought as 'purely Western' or 'purely Indian' can be very illusory. _____

(1) Thoughts are not the kind of things that can be easily categorized.
(2) Though 'occidentalism' and 'orientalism' as dichotomous concepts have found many adherents.
(3) 'East is East and West is West' has been a discredited notion for a long time now.
(4) Compartmentalizing thoughts is often desirable.
(5) The origin of a thought is not the kind of thing to which 'purity' happens easily.

Instructions for questions 71 - 75:

The passage given below is followed by a set of questions. Choose the most appropriate answer to each question.

Language is not a cultural artifact that we learn the way we learn to tell time or how the federal government works. Instead, it is a distinct piece of the biological makeup of our brains. Language is a complex, specialized skill, which develops in the child spontaneously, without conscious effort or formal instruction, is deployed without awareness of its underlying logic, is qualitatively the same in every individual, and is distinct from more general abilities to process information or behave intelligently. For these reasons some cognitive scientists have described language as a psychological faculty, a mental organ, a neural system, and a computational module. But I prefer the admittedly quaint term "instinct." It conveys the idea that people know how to talk in more or less the sense that spiders know how to spin webs. Web-spinning was not invented by some unsung spider genius and does not depend on having had the right education or on having an aptitude for architecture or the construction trades. Rather, spiders spin spider webs because they have spider brains, which give them the urge to spin and the competence to succeed. Although there are differences between webs and words, I will encourage you to see language in this way, for it helps to make sense of the phenomena we will explore.

Thinking of language as an instinct inverts the popular wisdom, especially as it has been passed down in the canon of the humanities and social sciences. Language is no more a cultural invention than is upright posture. It is not a manifestation of a general capacity to use symbols: a three-year-old, we shall see, is a grammatical genius, but is quite incompetent at the visual arts, religious iconography, traffic signs, and the other staples of the semiotics curriculum. Though language is a magnificent ability unique to Homo sapiens among living species, it does not call for sequestering the study of humans from the domain of biology, for a magnificent ability unique to a particular living species is far from unique in the animal kingdom. Some kinds of bats home in on flying insects using Doppler sonar. Some kinds of migratory birds navigate thousands of miles by calibrating the positions of the constellations against the time of day and year. In nature's talent show, we are simply a species of primate with our own act, a knack for communicating information about who did what to whom by modulating the sounds we make when we exhale.

Once you begin to look at language not as the ineffable essence of human uniqueness but as a biological adaption to communicate information, it is no longer as tempting to see language as an insidious shaper of thought, and, we shall see, it is not. Moreover, seeing language as one of nature's engineering marvels - an organ with "that perfection of structure and co-adaptation which justly excites our admiration," in Darwin's words- gives us a new respect for your ordinary Joe and the much-maligned English language (or any language). The complexity of language, from the scientist's point of view, is part of our biological birthright; it is not something that parents teach their children or something that must be elaborated in school- as Oscar Wilde said, "Education is an admirable thing, but it is well to remember from time to time that nothing that is worth knowing can be taught." A preschooler's tacit

knowledge of grammar is more sophisticated than the thickest style manual or the most state-of-the-art computer language system, and the same applies to all healthy human beings, even the notorious syntax-fracturing professional athlete and the, you know, like, inarticulate teenage skateboarder. Finally, since language is the product of a well-engineered biological instinct, we shall see that it is not the nutty barrel of monkeys that entertainer-columnists make it out to be.

71. According to the passage, which of the following does not stem from popular wisdom on language?

(1) Language is a cultural artifact.
(2) Language is a cultural invention.
(3) Language is learnt as we grow.
(4) Language is unique to Homo sapiens.
(5) Language is a psychological faculty.

72. Which of the following can be used to replace the "spiders know how to spin webs" analogy as used by the author?

(1) A kitten learning to jump over a wall
(2) Bees collecting nectar
(3) A donkey carrying a load
(4) A horse running a Derby
(5) A pet dog protecting its owner's property

73. According to the passage, which of the following is unique to human beings?

(1) Ability to use symbols while communicating with one another.
(2) Ability to communicate with each other through voice modulation.
(3) Ability to communicate information to other members of the species.
(4) Ability to use sound as means of communication.
(5) All of the above.

74. According to the passage, complexity of language cannot be taught by parents or at school to children because

(1) children instinctively know language.
(2) children learn the language on their own.
(3) language is not amenable to teaching.
(4) children know language better than their teachers or parents.
(5) children are born with the knowledge of semiotics.

75. Which of the following best summarizes the passage?

(1) Language is unique to Homo sapiens.
(2) Language is neither learnt nor taught.
(3) Language is not a cultural invention or artifact as it is made out.
(4) Language is instinctive ability of human beings.
(5) Language is use of symbols unique to human beings.

Instructions for questions 76 - 80:

The passage given below is followed by a set of questions. Choose the most appropriate answer to each question.

When I was little, children were bought two kinds of ice cream, sold from those white wagons with canopies made of silvery metal: either the two-cent cone or the four-cent ice-cream pie. The two-cent cone was very small, in fact it could fit comfortably into a child's hand, and it was made by taking the ice cream from its container with a special scoop and piling it on the cone. Granny always suggested I eat only a part of the cone, then throw away the pointed end, because it had been touched by the vendor's hand (though that was the best part, nice and crunchy, and it was regularly eaten in secret, after a pretence of discarding it).

The four-cent pie was made by a special little machine, also silvery, which pressed two disks of sweet biscuit against a cylindrical section of ice cream. First you had to thrust your tongue into the gap between the biscuits until it touched the central nucleus of ice cream; then, gradually, you ate the whole thing, the biscuit surfaces softening as they became soaked in creamy nectar. Granny had no advice to give here: in theory the pies had been touched only by the machine; in practice, the vendor had held them in his hand while giving them to us, but it was impossible to isolate the contaminated area.

I was fascinated, however, by some of my peers, whose parents bought them not a four-cent pie but two two-cent cones. These privileged children advanced proudly with one cone in their right hand

and one in their left; and expertly moving their head from side to side, they licked first one, then the other. This liturgy seemed to me so sumptuously enviable, that many times I asked to be allowed to celebrate it. In vain. My elders were inflexible: a four-cent ice, yes; but two two-cent ones, absolutely no.

As anyone can see, neither mathematics nor economy nor dietetics justified this refusal. Nor did hygiene, assuming that in due course the tips of both cones were discarded. The pathetic, and obviously mendacious, justification was that a boy concerned with turning his eyes from one cone to the other was more inclined to stumble over stones, steps, or cracks in the pavement. I dimly sensed that there was another secret justification, cruelly pedagogical, but I was unable to grasp it.

Today, citizen and victim of a consumer society, a civilization of excess and waste (which the society of the thirties was not), I realize that those dear and now departed elders were right. Two two-cent cones instead of one at four cents did not signify squandering, economically speaking, but symbolically they surely did. It was for this precise reason, that I yearned for them: because two ice creams suggested excess. And this was precisely why they were denied me: because they looked indecent, an insult to poverty, a display of fictitious privilege, a boast of wealth. Only spoiled children ate two cones at once, those children who in fairy tales were rightly punished, as Pinocchio was when he rejected the skin and the stalk. And parents who encouraged this weakness, appropriate to little parvenus, were bringing up their children in the foolish theatre of "I'd like to but I can't." They were preparing them to turn up at tourist-class check-in with a fake Gucci bag bought from a street peddler on the beach at Rimini.

Nowadays the moralist risks seeming at odds with morality, in a world where the consumer civilization now wants even adults to be spoiled, and promises them always something more, from the wristwatch in the box of detergent to the bonus bangle sheathed, with the magazine it accompanies, in a plastic envelope. Like the parents of those ambidextrous gluttons I so envied, the consumer civilization pretends to give more, but actually gives, for four cents, what is worth four cents. You will throw away the old transistor radio to purchase the new one, that boasts an alarm clock as well, but some inexplicable defect in the mechanism will guarantee that the radio lasts only a year. The new cheap car will have leather seats, double side mirrors adjustable from inside, and a panelled dashboard, but it will not last nearly so long as the glorious old Fiat 500, which, even when it broke down, could be started again with a kick.

The morality of the old days made Spartans of us all, while today's morality wants all of us to be Sybarites.

76. Which of the following cannot be inferred from the passage?

(1) Today's society is more extravagant than the society of the 1930s.
(2) The act of eating two ice cream cones is akin to a ceremonial process.
(3) Elders rightly suggested that a boy turning eyes from one cone to the other was more likely to fall.
(4) Despite seeming to promise more, the consumer civilization gives away exactly what the thing is worth.
(5) The consumer civilization attempts to spoil children and adults alike.

77. In the passage, the phrase "little parvenus" refers to

(1) naughty midgets.
(2) old hags.
(3) arrogant people.
(4) young upstarts.
(5) foolish kids.

78. The author pined for two two-cent cones instead of one four-cent pie because

(1) it made dietetic sense.
(2) it suggested intemperance.
(3) it was more fun.
(4) it had a visual appeal.
(5) he was a glutton.

79. What does the author mean by "nowadays the moralist risks seeming at odds with morality"?

(1) The moralists of yesterday have become immoral today.
(2) The concept of morality has changed over the years.
(3) Consumerism is amoral.

(4) The risks associated with immorality have gone up.
(5) The purist's view of morality is fast becoming popular.

80. According to the author, the justification for refusal to let him eat two cones was plausibly

(1) didactic (2) dietetic
(3) dialectic (4) diatonic
(5) diastolic

Instructions for questions 81 - 85:

The passage given below is followed by a set of questions. Choose the most appropriate answer to each question.

A remarkable aspect of art of the present century is the range of concepts and ideologies which it embodies. It is almost tempting to see a pattern emerging within the art field- or alternatively imposed upon it a posteriori- similar to that which exists under the umbrella of science where the general term covers a whole range of separate, though interconnecting, activities. Any parallelism is however- in this instance at least- misleading. A scientific discipline develops systematically once its bare tenets have been established, named and categorized as conventions. Many of the concepts of modern art, by contrast, have resulted from the almost accidental meetings of groups of talented individuals at certain times and certain places. The ideas generated by these chance meetings had twofold consequences. Firstly, a corpus of work would be produced which, in great part, remains as a concrete record of the events. Secondly, the ideas would themselves be disseminated through many different channels of communication- seeds that often bore fruit in contexts far removed from their generation. Not all movements were exclusively concerned with innovation. Surrealism, for instance, claimed to embody a kind of insight which can be present in the art of any period. This claim has been generally accepted so that a sixteenth century painting by Spranger or a mysterious photograph by Atget can legitimately be discussed in surrealist terms. Briefly, then, the concepts of modern art are of many different (often fundamentally different) kinds and resulted from the exposures of painters, sculptors and thinkers to the more complex phenomena of the twentieth century, including our ever increasing knowledge of the thought and products of earlier centuries. Different groups of artists would collaborate in trying to make sense of rapidly changing world of visual and spiritual experience. We should hardly be surprised if no one group succeeded completely, but achievements, though relative, have been considerable. Landmarks have been established - concrete statements of position which give a pattern to a situation which could easily have degenerated into total chaos. Beyond this, new language tools have been created for those who follow- semantic systems which can provide a springboard for further explorations.

The codifying of art is often criticized. Certainly one can understand that artists are wary of being pigeon-holed since they are apt to think of themselves as individuals- sometimes with good reason. The notion of self-expression, however, no longer carries quite the weight it once did; objectivity has its defenders. There is good reason to accept the ideas codified by artists and critics, over the past sixty years or so, as having attained the status of independent existence- an independence which is not without its own value. The time factor is important here. As an art movement slips into temporal perspective, it ceases to be a living organism- becoming, rather, a fossil. This is not to say it becomes useless or uninteresting. Just as a scientist can reconstruct the life of a prehistoric environment from the messages codified into the structure of a fossil, so can an artist decipher whole webs of intellectual and creative possibility from the recorded structure of a 'dead' art movement. The artist can match the creative patterns crystallized into this structure against the potentials and possibilities of his own time. AS T.S Eliot observed, no one starts anything from scratch; however consciously you may try to live in the present, you are still involved with a nexus of behaviour patterns bequeathed from the past. The original and creative person is not someone who ignores these patterns, but someone who is able to translate and develop them so that they conform more exactly to his- and our- present needs.

81. Many of the concepts of modern art have been the product of

(1) ideas generated from planned deliberations between artists, painters and thinkers.

(2) the dissemination of ideas through the state and its organizations.
(3) accidental interactions among people blessed with creative muse.
(4) patronage by the rich and powerful that supported art.
(5) systematic investigation, codification and conventions.

82. In the passage, the word 'fossil' can be interpreted as

(1) an art movement that has ceased to remain interesting or useful.
(2) an analogy from the physical world to indicate a historic art movement.
(3) an analogy from the physical world to indicate the barrenness of artistic creations in the past.
(4) an embedded codification of pre-historic life.
(5) an analogy from the physical world to indicate the passing of an era associated with an art movement.

83. In the passage, which of the following similarities between science and art may lead to erroneous conclusions?

(1) Both, in general, include a gamut of distinct but interconnecting activities.
(2) Both have movements not necessarily concerned with innovation.
(3) Both depend on collaborations between talented individuals.
(4) Both involve abstract thought and dissemination of ideas.
(5) Both reflect complex priorities of the modern world.

84. The range of concepts and ideologies embodied in the art of the twentieth century is explained by

(1) the existence of movements such as surrealism.
(2) landmarks which give a pattern to the art history of the twentieth century.
(3) new language tools which can be used for further explorations into new areas.
(4) the fast changing world of perceptual and transcendental understanding.
(5) the quick exchange of ideas and concepts enabled by efficient technology.

85. The passage uses an observation by T.S. Eliot to imply that

(1) creative processes are not 'original' because they always borrow from the past.
(2) we always carry forward the legacy of the past.
(3) past behaviours and thought processes recreate themselves in the present and get labeled as 'original' or 'creative'.
(4) 'originality' can only thrive in a 'greenhouse' insulated from the past biases.
(5) 'innovations' and 'original thinking' interpret and develop on past thoughts to suit contemporary needs.

Instructions for questions 86 - 90:

The passage given below is followed by a set of five questions. Choose the **most appropriate** answer to each question.

To summarize the Classic Maya collapse, we can tentatively identify five strands. I acknowledge, however, that Maya archaeologists still disagree vigorously among themselves- in part, because the different strands evidently varied in importance among different parts of the Maya realm; because detailed archaeological studies are available for only some Maya sites; and because it remains puzzling why most of the Maya heartland remained nearly empty of population and failed to recover after the collapse and after re-growth of forests.

With those caveats, it appears to me that one strand consisted of population growth outstripping available resources: a dilemma similar to the one foreseen by Thomas Malthus in 1798 and being played out today in Rwanda, Haiti, and elsewhere. As the archaeologist David Webster succinctly puts it, "Too many farmers grew too many crops on too much of landscape." Compounding that mismatch between population and resources was the second strand: the effects of deforestation and hillside erosion, which caused a decrease in the amount of useable farmland at a time when more rather than less farmland was needed, and possibly exacerbated by an anthropogenic drought resulting from deforestation, by soil nutrient

depletion and other soil problems, and by the struggle to prevent bracken ferns from overrunning the fields.

The third strand consisted of increased fighting, as more and more people fought over fewer resources. Maya warfare, already endemic, peaked just before the collapse. That is not surprising when one reflects that at least five million people, perhaps many more, were crammed into an area smaller than the US state of Colorado (104,000 square miles). That warfare would have decreased further the amount of land available for agriculture, by creating no-man's lands between principalities where it was now unsafe to farm. Bringing matters to a head was the strand of climate change. The drought at the time of the Classic collapse was not the first drought that the Maya had lived through, but it was the most severe. At the time of previous droughts, there were still uninhabited parts of the Maya landscape, and people at a site affected by drought could save themselves by moving to another site. However, by the time of the Classic collapse the landscape was now full, there was no useful unoccupied land in the vicinity on which to begin anew, and the whole population could not be accommodated in the few areas that continued to have reliable water supplies.

As our fifth strand, we have to wonder why the kings and nobles failed to recognize and solve these seemingly obvious problems undermining their society. Their attention was evidently focused on their short-term concerns of enriching themselves, waging wars, erecting monuments, competing with each other, and extracting enough food from the peasants to support all those activities. Like most leaders throughout human history, the Maya kings and nobles did not heed long-term problems, insofar as they perceived them.

Finally, while we still have some other past societies to consider in this book before we switch our attention to the modern world, we must already be struck by some parallels between the Maya and the past societies. As on Mangareva, the Maya environmental and population problems led to increasing warfare and civil strife. Similarly, on Easter Island and at Chaco Canyon, the Maya peak population numbers were followed swiftly by political and social collapse. Paralleling the eventual extension of agriculture from Easter Island's coastal lowlands to its uplands, and from the Mimbres floodplain to the hills, Copan's inhabitants also expanded from the floodplain to the more fragile hill slopes, leaving them with a larger population to feed when the agricultural boom in the hills went bust. Like Easter Island chiefs erecting ever larger statues, eventually crowned by pukao, and like Anasazi elite treating themselves to necklaces of 2,000 turquoise beads, Maya kings sought to outdo each other with more and more impressive temples, covered with thicker and thicker plaster- reminiscent in turn of the extravagant conspicuous consumption by modern American CEOs. The passivity of Easter chiefs and Maya kings in the face of the real big threats to their societies completes our list of disquieting parallels.

86. According to the passage, which of the following best represents the factor that has been cited by the author in the context of Rwanda and Haiti?

(1) Various ethnic groups competing for land and other resources.
(2) Various ethnic groups competing for limited land resources.
(3) Various ethnic groups fighting with each other.
(4) Various ethnic groups competing for political power.
(5) Various ethnic groups fighting for their identity.

87. By an anthropogenic drought, the author means

(1) a drought caused by lack of rains.
(2) a drought caused due to deforestation.
(3) a drought caused by failure to prevent bracken ferns from overrunning the fields.
(4) a drought caused by actions of human beings.
(5) a drought caused by climate changes.

88. According to the passage, the drought at the time of Maya collapse had a different impact compared to the droughts earlier because

(1) the Maya kings continued to be extravagant when common people were suffering.
(2) it happened at the time of collapse of leadership among Mayas.
(3) it happened when the Maya population had occupied all available land suited for agriculture.

(4) it was followed by internecine warfare among Mayans.
(5) irreversible environmental degradation led to this drought.

89. According to the author, why is it difficult to explain the reasons for Maya collapse?

(1) Copan inhabitants destroyed all records of that period.
(2) The constant deforestation and hillside erosion have wiped out all traces of the Maya kingdom.
(3) Archaeological sites of Mayas do not provide any consistent evidence.
(4) It has not been possible to ascertain which of the factors best explains as to why the Maya civilization collapsed.
(5) At least five million people were crammed into a small area.

90. Which factor has not been cited as one of the factors causing the collapse of Maya society?

(1) Environmental degradation due to excess population
(2) Social collapse due to excess population
(3) Increased warfare among Maya people
(4) Climate change
(5) Obsession of Maya population with their own short-term concerns.

Answer Key

SECTION I			
Q.	**Ans.**	**Q.**	**Ans.**
1	**2**	21	**1**
2	**2**	22	**4**
3	**5**	23	**3**
4	**3**	24	**4**
5	**4**	25	**4**
6	**1**		
7	**2**		
8	**3**		
9	**5**		
10	**5**		
11	**3**		
12	**2**		
13	**3**		
14	**4**		
15	**1**		
16	**5**		
17	**1**		
18	**1**		
19	**5**		
20	**2**		

SECTION II			
Q.	**Ans.**	**Q.**	**Ans.**
26	**3**	46	**4**
27	**2**	47	**5**
28	**3**	48	**4**
29	**3**	49	**5**
30	**1**	50	**3**
31	**1**		
32	**4**		
33	**3**		
34	**3**		
35	**2**		
36	**1**		
37	**5**		
38	**5**		
39			
40	**1**		
41	**2**		
42	**4**		
43	**5**		
44	**5**		
45	**2**		

SECTION III			
Q.	**Ans.**	**Q.**	**Ans.**
51	**3**	71	**5**
52	**2**	72	**2**
53	**2**	73	**2**
54	**1**	74	**1**
55	**1**	75	**4**
56	**4**	76	**3**
57	**3**	77	**4**
58	**5**	78	**2**
59	**3**	79	**2**
60	**4**	80	**1**
61	**2**	81	**3**
62	**1**	82	**5**
63	**3**	83	**1**
64	**5**	84	**4**
65	**2**	85	**5**
66	**5**	86	**1**
67	**3**	87	**4**
68	**4**	88	**3**
69	**1**	89	**4**
70	**5**	90	**5**

1. If $mx^m - nx^n = 0$, then what is the value of $\frac{1}{x^m + x^n} + \frac{1}{x^m - x^n}$ in terms of x^n ?

(a) $\frac{2mn}{x^n(n^2 - m^2)}$ (b) $\frac{2mn}{x^n(n^2 + m^2)}$ (c) $\frac{2mn}{x^n(m^2 - n^2)}$ (d) $\frac{2mn}{x^n(m^2 + n^2)}$

2. If $\log(0.57) = \bar{1}.756$, then the value of

$\log 57 + \log(0.57)^3 + \log\sqrt{0.57}$ is :

(a) 0.902 (b) $\bar{2}.146$ (c) 1.902 (d) $\bar{1}.146$

3. In a certain zoo, there are 42 animals in one sector, 34 in the second sector and 20 in the third sector. Out of this, 24 graze in sector one and also in sector two. 10 graze in sector two and sector three, 12 graze in sector one and sector three. These figures also include four animals grazing in all the three sectors are now transported to another zoo, find the total number of animals.

(a) 38 (b) 56 (c) 54 (d) None of the above

4. The ratio of the roots of $bx^2 + nx + n = 0$ is $p : q$, then

(a) $\sqrt{\frac{q}{p}} + \sqrt{\frac{p}{q}} + \sqrt{\frac{\ell}{n}} = 0$ (b) $\sqrt{\frac{p}{q}} + \sqrt{\frac{q}{p}} + \sqrt{\frac{n}{\ell}} = 0$ (c) $\sqrt{\frac{q}{p}} + \sqrt{\frac{p}{q}} + \sqrt{\frac{\ell}{n}} = 0$ (d) $\sqrt{\frac{p}{q}} + \sqrt{\frac{q}{p}} + \sqrt{\frac{n}{\ell}} = 0$

5. The average age of a couple is 25 years. The average age of the family just after the birth of the first child was 18 years. The average age of the family just after the second child was born was 15 years. The average age of the family after the third and the fourth children (who are twins) were born was 12 years. If the present average age of the family of six persons is 16 years, how old is the eldest child ?

(a) 6 years (b) 7 years (c) 8 years (d) 9 years

6. 10% of the voters did not cast their vote in an election between two candidates. 10% of the votes polled were found invalid. The successful candidate got 54% of the valid votes and won by a majority of 1620 votes. The number of voters enrolled on the voters list was :

(a) 25000 (b) 33000 (c) 35000 (d) 40000

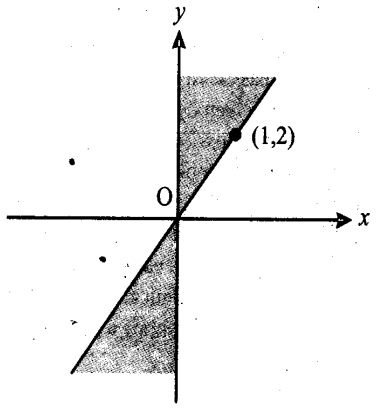
7. The resistance of a wire is proportional to its length and inversely proportional to the square of its radius. Two wires of the same material have the same resistance and their radii are in the ratio 9 : 8. If the length of the first wire is 162 cms., find the length of the other.

(a) 64 cm. (b) 120 cm. (c) 128 cm. (d) 132 cm.

8. A 20 litre vessel is filled with alcohol. Some of the alcohol is poured out into another vessel of an equal capacity, which is then completely filled by adding water. The mixture thus obtained is then poured into the first vessel to capacity. Then $6\frac{2}{3}$ litres is poured from the first vessel into the second. Both vessels now contain an equal amount of alcohol. How much alcohol was originally poured from the first vessel into the second ?

(a) 9 litres (b) 10 litres (c) 12 litres (d) 12.5 litres

9. The shaded portion of figure shows the graph of which of the following ?



(a) $x(y-2x) \geq 0$ (b) $x(y-2x) \leq 0$ (c) $x\left(y+\frac{1}{2}x\right) \geq 0$ (d) $x\left(y-\frac{1}{2}x\right) \leq 0$

10. If $f\left(x+\frac{y}{8}, x-\frac{y}{8}\right) = xy$, then $f(m,n)+f(n,m)=0$

(a) only when $m=n$ (b) only when $m \neq n$ (c) only when $m=-n$ (d) for all m and n

11. A person closes his account in an investment scheme by withdrawing Rs. 10,000. One year ago he had withdrawn Rs. 6000. Two years ago he had withdrawn Rs. 5000. Three years ago he had not withdrawn any money. How much money had he deposited approximately at the time of opening the account 4 years ago, if the annual simple interest is 10% ?

(a) Rs. 15600 (b) Rs. 16500 (c) Rs. 17280 (d) None of these

12. It takes 6 technicians a total of 10 hours to build a new server from direct computer, with each working at the same rate. If six technicians start to build the server at 11 : 00 am, and one technician per hour is added beginning at 5 :00 pm, at what time will the server be completed ?

(a) 6:40 pm (b) 7:00 pm (c) 7:20 pm (d) 8:00 pm

13. A ship 55 kms. from the shore springs a leak which admits 2 tones of water in 6 min ; 80 tones would suffer to sink her, but the pumps can throw out 12 tones an hour. Find the average rate of sailing that she may just reach the shore as she begins to sink.

(a) 5.5 km/h (b) 6.5 km/h (c) 7.5 km/h (d) 8.5 km/h

14. In a 400 meter race around a circular stadium having a circumference of 1000 meters, the fastest runner and the slowest runner reach the same point at the end of the 5th minute, for the first time after the start of the race. All the runners have the same starting point and each runner maintains a uniform speed throughout the race. If the fastest runner runs at twice the speed of the slowest runner, what is the time taken by the fastest runner to finish the race?

(a) 20 mins (b) 15 mins (c) 10 mins (d) 5 mins

15. A train crosses a platform 100 metres long in 60 seconds at a speed of 45 km per hour. The time taken by the train to cross an electric pole, is

(a) 8 seconds (b) 1 minute (c) 52 seconds (d) Data inadequate

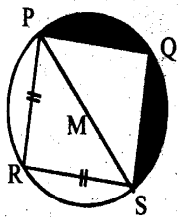
16. If $x = 1+2a+3a^2+4a^2+\ldots\ldots (-1<a<1)$ and $y = 1+3b+6b^2+10b^3+\ldots\ldots (-1<b<1)$, then find $1+ab+(ab)^2+(ab)^3+\ldots\ldots$ in terms of x and y.

(a) $\frac{x^{1/2}y^{1/3}}{x^{1/2}+y^{1/3}-1}$ (b) $\frac{xy}{x+y-1}$ (c) $\frac{x^{1/3}y^{2/3}}{x^{1/3}+y^{1/2}-1}$ (d) None of these

17. Two vertical lamp-posts of equal height stand on either side of a road 50m wide. At a point P on the road between them, the elevation of the tops of the lamp-posts are 60° and 30°. Find the distance of P from the lamp post which makes angle of 60°.

(a) 25 m (b) 12.5 m (c) 16.5 m (d) 20.5 m

18. M is the centre of the circle. $\ell(QS) = 10\sqrt{2}$. $\ell(PR) = \ell(RS)$ and PR || QS. Find the area of the shaded region. (use $\pi = 3$)



(a) 100 sq. units (b) 114 sq. units (c) 50 sq. units (d) 200 sq. units

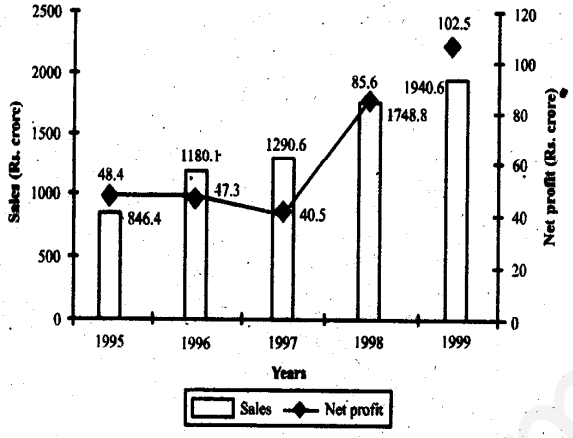
19. There are three coplanar parallel lines. If any p points are taken on each of the lines, then find the maximum number of triangles with the vertices of these points.

(a) $p^2(4p-3)$ (b) $p^3(4p-3)$ (c) $p(4p-3)$ (d) p^3

20. A and B throw with one dice for a stake of Rs. 11 which is to be won by the player who first throws 6. If A has the first throw, what are their respective expectations

(a) Rs 7, Rs 4 (b) Rs 6, Rs 5 (c) Rs 4, Rs 7 (d) Rs 5 , Rs 6

DIRECTIONS (Qs. 21 – 25) : These are based on the following Line Chart : The sales and net profit of XPL Electronics in Rs. crores is given below.



Note : Net profit = Gross Profit – Tax. Gross profit = Sales – Expenses. The figures for sales is given at the bottom of the bar chart and the figures for net profit is given on top of the line chart.

21. What is the net profit percentage of XPL in 1998?
(a) 4.6% (b) 4.8% (c) 5.1% (d) 6.2%

22. Which year showed the maximum percentage increase in sales?
(a) 1999 (b) 1998 (c) 1997 (d) 1996

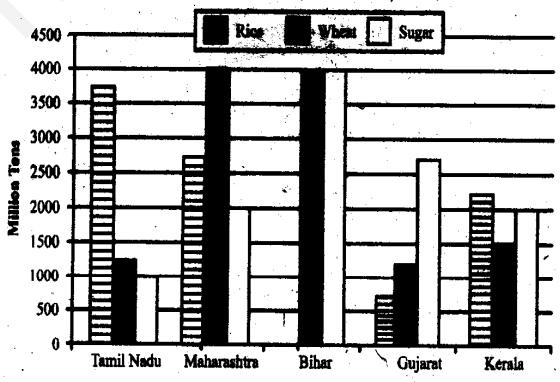
23. By how much percentage has the net profit dropped in 1996?
(a) 1.1% (b) 2.27% (c) 2.53% (d) Cannot be determined

24. If XPL sold 20,000 units in both 1998 and 1999, by what percentage has the price per unit changed?
(a) 8.7% (b) 10.96% (c) 9.86% (d) Cannot be determined

25. The year in which the expenses of XPL Electronic are highest is
(a) 1999 (b) 1998 (c) 1997 (d) Cannot be determined

DIRECTIONS (Qs. 26 to 30) : These are based on the following data.

The following chart gives the production of three major crops (in million tons) across five Indian states in the year 1998.



26. If Tamil Nadu registers an annual increase of 22 per cent in rice production, what was the rice production in Tamil Nadu in 1998?
(a) 1900 million tons (b) 2300 million tons (c) 2180 million tons (d) 2520 million tons

27. What is the ratio of total wheat production in the five states to total sugar production?
(a) 0.6 (b) 1.4 (c) 1.0 (d) 0.75

28. If sugar costs Rs. 700 per ton and wheat costs Rs. 400 per ton, what was the total worth of sugar and wheat production in India?
(a) 42 million (b) 21 million (c) 10.5 million (d) Data insufficient

29. If the yield per hectare of sugar is 3.86 tons, what is the ratio of area employed to produce sugar in Bihar to Gujarat?
(a) 1.15 (b) 1.45 (c) 1.35 (d) Data insufficient

30. If these five states constitute 77 per cent of the country's wheat production and 23 per ent of country's wheat consumption is imported, what is the amount of wheat imported in 1998?
(a) 4700 million tons (b) 3900 million tons (c) 3500 million tons (d) Data insufficient

DIRECTIONS (Qs. 31 to 35) : Read the following information and answer the quetions that follow:

The cars at a dealership come with a choice of the following options : air-conditioning, a cassette deck, leather seats, power windows, a sunroof and tinted glass. None of the cars has any other optional equipment. The following conditions apply :

If a car has leather seats, it also has a cassette deck. If a car has a cassette deck, it also has power windows; If a car has power windows, it also has a cassette deck.

Cars with tinted glass have a sunroof, but no air-conditioning. Cars that have air-conditioning have, at most, two other options.

31. If a car has both tinted glass and leather seats, what is the greatest number of additional options that the car could have?
(a) 1 (b) 2 (c) 3 (d) 4

32. Which one of the following could be a complete and accurate list of options on a car?
(a) air-conditioning, cassette deck, leather seats, power windows
(b) air-conditioning , cassette deck, leather seats, sunroof
(c) cassette deck, leather seats, sunroof, tinted glass
(d) cassette deck, power windows, sunroof, tinted glass

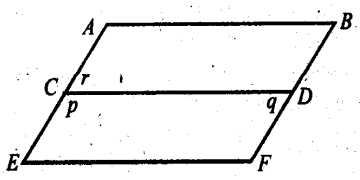
33. If a car has power windows and a sunroof, how many different sets of options, at most, can the car have?
(a) 2 (b) 3 (c) 4 (d) 5

34. If a car has exactly two options, which one of the following could they be?
(a) air-conditioning and cassette deck
(b) tinted glass and sunroof
(c) cassette deck and leather seats
(d) power windows and sunroof

35. If a car has tinted glass, which one of the following CANNOT be true?
(a) The car has 3 options.
(b) The car has 4 options.
(c) The car has power windows and a sunroof.
(d) The car does not have both leather seats and a cassette deck.

DIRECTIONS (Qs. 36 to 40) : Each of the following problems consists of a quetion and the statements labiled (1) and (2). You must decide whether the data given in the statements are sufficient to answers the question.

36. If both ABDC and CDFE are parallelograms. what is $q + r$?
(1) $r = 70$ (2) $p = 110$



(a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
(b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
(c) BOTH statements TOGETHER are sufficient, but NEITHER satement alone is sufficient.
(d) EACH statement ALONE is sufficient.

37. A certain stadium is currently full to $\frac{13}{16}$ of its maximum seating capacity. What is the maximum seating capacity of the stadium?

(1) If 1,250 people were to enter the stadium, the stadium would be full to $\frac{15}{16}$ of its maximum seating capacity.

(2) If 2,500 people were to leave the stadium, the stadium would be full to $\frac{9}{16}$ of its maximum seating capacity.

(a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
(b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
(c) BOTH statements TOGETHER are sufficient, but NEITHER satement alone is sufficient.
(d) EACH statement ALONE is sufficient.

38. If n is an integer, is n even?

(1) $2n$ is an even integer.
(2) $n-1$ is an odd integer.
(a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
(b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
(c) BOTH statements TOGETHER are sufficient, but NEITHER satement alone is sufficient.
(d) EACH statement ALONE is sufficient.

39. What is the value of x?

(1) $x^2-5x+4=0$
(2) x is not prime.
(a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
(b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
(c) BOTH statements TOGETHER are sufficient, but NEITHER satement alone is sufficient.
(d) Statements (1) and (2) TOGETHER are NOT sufficient.

40. A fish tank contains a number of fish, including 5 Fanails. If two fish are selected from the tank at random, what is the probability that both will be Fantails?

(1) The probability that the first fish chosen will be a Fantail is $\frac{1}{2}$.

(2) The probability that the second fish chosen will be a Fantail is $\frac{4}{9}$.

(a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
(b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
(c) BOTH statements TOGETHER are sufficient, but NEITHER satement alone is sufficient.
(d) EACH statement ALONE is sufficient.

DIRECTIONS (Qs. 41 to 50) : Read the following passages-I, II and III and give answer based on it.

PASSAGE-I

History has shaped academic medical centers (AMCs) to perform 3 functions : patient care, research, and teaching. These 3 missions are now fraught with problems becuase the attempt to combine them has led to such inefficiencies as duplication of activities and personnel, inpatient procedures that could and should have been out-patient procedures, and unwieldy administrative bureaucracies.

One source of inefficiency derives from mixed lines of authority. Clinical chiefs and practitioners in AMCs are typically responsible to the hospital for practice issues but to the medical school for promotion, marketing, membership in a faculty practice plan, and educational accreditation. Community physicians with privileges at a university hospital add more complications. They have no official affiliation with the AMC's medical school connected, but their cooperation with faculty members is essential for proper patient treatment. The fragmented accountability is heightened by the fact that 3 different groups often vie for the loyalty of physicians who receive research. The medical school may wish to capitalize on the research for its educational value to students; the hospital may desire the state-of-the-art treatment methods resulting from the research; and the grant administrators may focus on the researchers' humanitarian motives. Communication among these groups is rarely coordinated, and the physicians may serve whichever group promises the best perks and ignore the rest – which inevitably strains relationships.

Another source of inefficiency is the fact that physicians have obligations to many different groups: patients, students, faculty members, referring physicians, third-party payers, and staff members, all of whom have varied expectations. Satisfying the interests of one group may alienate others. Patient care provides a common example. For the benefit of medical students, physicians may order too many tests, prolong patient visits, or encourage experimental studies of a patient. If AMC faculty physicians were more aware of how much treatments of specific illnesses cost, and of how other institutions treat patient conditions, they would be better practitioners, and the educational and clinical care missions of AMCs would both be better served.

A bias toward specialization adds yet more inefficiency. AMCs are viewed as institutions serving the gravest cases in need of the most advanced treatments. The high number of specialty residents and the presence of burn units, blood banks, and transplant centers validate this belief. Also present at AMCs, though less conspicuous, are facilities for ordinary primary care patients. In fact, many patients choose to visit an AMC for primary care because they realize that any necessary follow-up can occur almost instantaneously. While AMCs have emphasized cutting-edge specialty medicine, their more routine medical services need development and enhancement.

A final contribution to inefficiency is organizational complacency. Until recently, most academic medical centers drew the public merely by existing. The rising presence, however, of tertiary hospitals with patient care as their only goal has immersed AMCs in a very competitive market. It is only in the past several years that AMCs have started to recognize and develop strategies to address competition.

41. The author's attitude toward the inefficiences at academic medical centers is one of
    (a) reluctant acquiescence
    (b) strident opposition
    (c) agonized indecision
    (d) reasoned criticism

42. The author of the passage would most likely agree with which of the following statements about primary care at AMCs?
    (a) AMCs would make more money if they focused mainly on primary care.
    (b) Burn and transplant patients need specialty care more than primary care.
    (c) AMCs offer the best primary care for most patients.
    (d) Inefficiencies at AMCs would be reduced if better primary care were offered.

43. The author's primary purpose in this passage is to
    (a) discuss the rise and fall of academic medical centers
    (b) explain that multiple lines of authority in a medical centre create inefficiencies
    (c) delineate conflicts occurring in academic medical facilities
    (d) examine the differences between academic and other health care entities

44. The author implies which of the following about faculty physicians at AMCs?
    (a) Most of them lack good business sense.
    (b) They put patients' physical health above their hospitals' monetary concerns.
    (c) They sometimes focus on education at the expense of patient care.
    (d) They lack official affiliation with the medical schools connected to AMCs.

PASSAGE-II

Founded at the dawn of the modern industrial era, the nearly forgotten Women's Trade Union League (WTUL) played an instrumental Line role in advancing the cause of working women throughout the early part of the twentieth century. In the face of considerable adversity, the WTUL made a contribution far greater than did most historical footnotes.

The organization's successes did not come easily; conflict beset the WTUL in many forms.

During those early days of American unions, organized labour was aggressively opposed by both industry and government. The WTUL, which represented a largely unskilled labour force, had little leverage against these powerful opponents. Also, because of the skill level of its workers as well as inherent societal gender bias, the WTUL had great difficulty finding allies among other unions. Even the large and powerful American Federation of Labour (AFL), which nominally took the WTUL under its wing, kept it at a distance. Because the AFL'S power stemmed from its highly skilled labour force, the organization saw little economic benefit in working with the WTUL. The affiliation provided the AFL with political cover, allowing it to claim support for women workers; in return, the WTUL gained a potent but largely absent ally.

The WTUL also had to overcome internal discord. While the majority of the group's members were working women, a sizeable and powerful minority consisted of middle- and upperclass social reformers whose goals extended beyond labour reform. While workers argued that the WTUL should focus its efforts on collective bargaining and working conditions, the reformers looked beyond the workplace, seeking state and national legislation aimed at education reform and urban poverty relief as well as workplace issues.

Despite these obstacles, the WTUL accomplished a great deal. The organization was instrumental in the passage of state laws mandating an eight-hour workday, a minimum wage for women, and a ban on child labour. It provided seed money to women who organized workers in specific plants and industries, and also established strike funds and soup kitchens to support striking unionists. After the tragic Triangle Shirtwaist Company fire of 1911, the WTUL launched a four-year investigation whose conclusions formed the basis of much subsequent workplace safety legislation. The organization also offered a political base for all reform-minded women, and thus helped develop the next generation of American leaders. Eleanor Roosevelt was one of many prominent figures to emerge from the WTUL.

The organization began a slow death in the late 1920s, when the Great Depression choked off its funding. The organization limped through the 1940s; the death knell eventually rang in 1950, at the onset of the McCarthy era. A turn of-the-century labour organization dedicated to social reform, one that during its heyday was regarded by many as "radical," stood little chance of weathering that storm. This humble ending, however, does nothing to diminish the accomplishments of an organization that is yet to receive its historical due.

45. The primary purpose of this passage is to
    (a) describe the barriers confronting women in the contemporary workplace
    (b) call readers' attention to an overlooked contributor to American history
    (c) critique the methods employed by an important labour union
    (d) rebuke historians for failing to cover the women's labor movement adequately

46. Which of the following best characterizes the American Federation of Labour's view of the Women's Trade Union League, as it is presented in the passage?
    (a) The WTUL was an important component of the AFLs multifront assault on industry and its treatment of workers:
    (b) Because of Eleanor Roosevelt's affiliation with the organization. the WTUL was a vehicle through which the AFL could gain access to the White House.
    (c) The WTUL was to be avoided because the radical element within it attracted unwanted government scrutiny.
    (d) The WTUL offered the AFL some political capital but little that would assist it in labour negotiations.

47. Each of the following is cited in the passage as an accomplishment of the Women's Trade Union League EXCEPT
    (a) It organized a highly skilled workforce to increase its bargaining power.
    (b) It contributed to the development of a group of leaders in America.
    (c) It provided essential support to striking women.
    (d) It helped fund start-up unions for women.

PASSAGE-III

The function of strategic planning is to position a company for long-term growth and expansion in a variety of markets by analyzing its strengths and weaknesses and examining current and potential opportunities. Based on this information, the company develops strategy for itself. That strategy then becomes the basis for supporting strategies for its various departments.

This is where all too many strategic plans go astray-at implementation. Recent business management surveys show that most CEOs who have a strategic plan are concerned with the potential breakdown in the implementation of the plan. Unlike 1980s corporations that blindly followed their 5-year plans, even when they were misguided, today's corporations tend to second-guess.

Outsiders can help facilitate the process, but in the final analysis, if the company doesn't make the plan, the company won't follow the plan. This was one of the problems with strategic planning in the 1980s. In that era, it was an abstract, top-down process involving only a few top corporate officers and hired guns. Number crunching experts came into a company and generated tome-like volumes filled with a mixture of abstruse facts and grand theories which had little to do with the day- to-day realities of the company. Key middle managers were left out of planning sessions, resulting in lost opportunitles and ruffled feelings.

However, more hands-on strategic planning can produce startling results. A recent survey queried more than a thousand small-to-medium sized businesses to compare companies with a strategic plan to companies without one. The survey found that companies with strategic plans had annual revenue growth of 6.2 percent as opposed to 3.8 percent for the other companies.

Perhaps most important, a strategic plan helps companies anticipate-and survive-change. New technology and the mobility of capital mean that markets can shift faster than ever before. Some financial analysts wonder why they should bother planning two years ahead when market dynamics might be transformed by next quarter. The fact is that it's the very pace of change that makes planning so crucial. Now, more than ever, companies have to stay alert to the marketplace. In an environment of continual and rapid change, long range planning expands options and organizational flexibility.

48. The primary purpose of the passage is to
    (a) refute the idea that change is bad for a corporation's long-term health
    (b) describe how long-term planning, despite some potential pitfalls, can help a corporation to grow
    (c) compare and contrast two styles of corporate planning
    (d) evaluate the strategic planning goals of corporate America today

49. It can be inferred from the passage that, in general, strategic planning during the 1980s had all of the following shortcomings EXCEPT
    (a) a reliance on outside consultants who did not necessarily understand the nuts and bolts of the business
    (b) a dependence on theoretical models that did not always perfectly describe the workings of the company
    (c) an inherent weakness in the company's own ability to implement the strategic plan
    (d) an excess of information and data that made it difficult to get to key concepts

50. The author most likely mentions the results of the survey of 1,000 companies in order to
(a) put forth an opposing view on strategic plans so that she can then refute it
(b) illustrate that when strategic planning is "hands-on," it produces uninspiring results
(c) give a concrete example of why strategic planning did not work during the 1980s
(d) support her contention that strategic planning when done correctly can be very successful

51. Over the last 20 years the rate of increase in total production in Workland has been second to none in the world. However, the growth is more modest when calculated per capita of total population. Over the last ten years progress has been much slower.
If the information above is accurate, which of the following must be true?
(a) Workland has a very large population.
(b) Productivity per capita has not grown as fast during the past ten years.
(c) Total production has increased faster than population growth.
(d) The birth rate has declined.

52. Between 1979 and 1983, the number of unincorporated business self-employed women increased five times faster than the number of self employed men and more than three times faster than women wage-and-salary workers. Part-time self-employment among women increased more than full-time self-employment.
Each of the following, if true, could help to account for this trend except :
(a) Owning a business affords flexibility to combine work and family responsibilities.
(b) The proportion of women studying business administration courses has grown considerable.
(c) There are more self-employed women than men.
(d) Uninorporated service industries have grown by 300 percent over the period; the ratio of women to men in this industry is three to one.

53. There is no clear line between health and illness; it is easy to forget what it feels like to be really well and to get gradually used to often having a headache, feeling irritable, or tired. There is an unrecognized proportion of the population that has been tipped over the brink into ill health by ubiquitous contaminants.
Which of the following statements best describes the purpose of the abvoe?
(a) The public must be encouraged to have regular medical examinations.
(b) The public must be warned to be aware of various physical and chemical hazards.
(c) The public must be warned to treat seriously such symptoms as headaches, irritability, and tiredness.
(d) The medical professional is not always capable of diagnosing illness.

DIRECTIONS (Qs. 54 – 55) : In each question, there are five sentences. Each sentence has a pair of words that are italicized and highlighted. From the italicized and highlighted words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate one.

54. The ***further*** [A] /***farther*** [B] he pushed himself, the more disillusioned he grew.
For the crowds it was more of a ***historical*** [A] / ***historic*** [B] event; for their leader, it was just another day.
The old man has a healthy ***distrust*** [A] / ***mistrust*** [B] for all new technology. This film is based on a ***real*** [A] / ***true*** [B] story.
One suspects that the ***compliment*** [A] / ***complement*** [B] was backhanded.
(a) BABAB (b) ABABA (c) BAABA (d) BBAAB

55. ***Regrettably*** [A] / ***Regretfully*** [B] I have to decline your invitation.
I am drawn to the poetic, ***sensual*** [A] / ***sensuous*** [B] quality of her paintings.
He was ***besides*** [A] / ***beside*** [B] himself with age when I told him what I had done.
After brushing against a ***stationary*** [A] / ***stationery*** [B] truck my car turned turtle.
As the water began to rise ***over*** [A] / ***above*** [B] the danger mark, the signs of an imminent flood were clear.
(a) BAABA (b) BBBAB (c) AAABA (d) BBAAB

DIRECTIONS (Qs. 56 - 57) : In each question, the word at the top is used in four different ways, numbered (a) to (d). Choose the option in which the usage of the word is *Incorrect or Inappropriate.*

56. **SORT**

(a) Let's sort these boys into four groups
(b) They serve tea of a sort on these trains.
(c) Farmers of all sort attended the rally.
(d) What sort of cheese do you use in pizza?

57. **HOST**

(a) A virus has infected the host computer
(b) Ranchi will play the host to the next national film festival
(c) Kerala's forests are host to a range of snakes
(d) If you host the party, who will foot the bill

58. Select the one which would best fill the blanks.

Football evokes a _____ response in India compared to cricket, the almost _____ the nation

(a) tepid, boiling (b) lukewarm, electrifies (c) turbid, fascinating (d) apocryphal, genuinely fascinates

DIRECTIONS (Qs. 59-60) : Each question consists of four sentences on a topic. Some sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically correct and appropriate sentence(s).

59. A. Last Sunday, Archana had nothing to do.
B. After waking up, she lay on the bed thinking of what to do.
C. At 11 o'clock she took shower and got ready.
D. She spent most of the day shopping.

(a) B and C (b) C (c) A and B (d) B, C and D

60. A. Large reductions in the ozone layer, which sits about 15-30 km above the Earth, take place each winter over the polar regions, especially the Antarctic, as low temperatures allow the formation of stratospheric clouds that assist chemical reactions breaking down ozone.
B. Industrial chemicals containing chlorine and bromine have-been blamed for thinning the layer because they attack the ozone molecules, making them to break apart.
C. Many an offending chemicals have now been banned.
D. It will still take several decades before these substances have disappeared from the atmosphere.

(a) D (b) B&D (c) A&D (d) A&C

Answers:

1	(a)
2	(d)
3	(c)
4	(b)
5	(d)
6	(a)
7	(c)
8	(b)
9	(a)
10	(d)
11	(a)
12	(d)
13	(a)
14	(c)
15	(c)
16	(a)
17	(b)
18	(c)
19	(a)
20	(b)

21	(c)
22	(d)
23	(b)
24	(b)
25	(d)
26	(d)
27	(b)
28	(d)
29	(b)
30	(d)
31	(c)
32	(d)
33	(c)
34	(b)
35	(a)
36	(d)
37	(d)
38	(b)
39	(d)
40	(d)

41	(d)
42	(d)
43	(d)
44	(c)
45	(b)
46	(d)
47	(a)
48	(b)
49	(c)
50	(d)
51	(b)
52	(c)
53	(b)
54	(b)
55	(b)
56	(c)
57	(c)
58	(b)
59	(d)
60	(c)

SECTION - I (20 - QUESTIONS)

1. If r, s, and t are consecutive odd integers with $r < s < t$, which of the following must be true?

(a) $rs = t$ (b) $r + t = 2t - s$

(c) $r + s = t - 2$ (d) $r + t = 2s$

2. Let S be the set of rational numbers with the following properties:

I. $\frac{1}{2} \in S$; II. If $x \in S$, then both $\frac{1}{x+1} \in S$ and $\frac{x}{x+1} \in S$

Which of the following is true?

(a) S contains all rational numbers in the interval $0 < x < 1$.

(b) S contains all rational numbers in the interval $-1 < x < 1$.

(c) S contains all rational numbers in the interval $-1 < x < 0$.

(d) S contains all rational numbers in the interval $1 < x < \infty$.

3. P, Q and R are three consecutive odd numbers in ascending order. If the value of three times P is three less than two times R, find the value of R.

(a) 5 (b) 7

(c) 9 (d) 11

4. Consider the following statements :

When two straight lines intersect, then :

I adjacent angles are complementary

II adjacent angles are supplementary

III opposite angles are equal

IV opposite angles are supplementary

Of these statements:

(a) (I) and (III) are correct (b) (II) and (III) are correct

(c) (I) and (IV) are correct (d) (II) and (IV) are correct

5. A pole has to be erected on the boundary of a circular park of diameter 13 metres in such a way that the difference of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. The distance of the pole from one of the gates is:

(a) 8 metres (b) 8.25 metres

(c) 5 metres (d) None these

6. From a square piece of card-board measuring $2a$ on each side of a box with no top is to be formed by cutting out from each corner a square with sides b and bending up the flaps. The value of b for which the box has the greatest volume is

(a) $b = \frac{a}{5}$ (b) $b = \frac{a}{4}$

(c) $b = \frac{2a}{3}$ (d) $b = \frac{a}{2}$

7. The sum of the areas of two circles which touch each other externally is 153π. If the sum of their radii is 15, find the ratio of the larger to the smaller radius

(a) 4 (b) 2

(c) 3 (d) None of these

8. Consider the following statements:

I If $a^x = b$, $b^y = c$, $c^z = a$, then $xyz = 1$

II If $p = a^x$, $q = a^y$, $(p^y q^y)^z = a^2$, then $xyz = 1$

III If $x^a = y^b = z^c$ and $ab + bc + ca = 0$ then $xyz = 1$

Of these statements:

(a) I and II are correct (b) II and III are correct

(c) Only I is correct (d) All I , II and III are correct

9. If a, b and c are three real numbers, then which of the following is not true?

(a) $|a+b| \le |a|+|b|$ (b) $|a-b| \le |a|+|b|$

(c) $|a-b| \le |a|-|b|$ (d) $|a-c| \le |a-b|+|b-c|$

10. Let S denote the infinite sum

$2+5x+9x^2+14x^3+20x^4+\ldots\ldots$, where $|x|<1$ and the coefficient of x^{n-1} is $\frac{1}{2}n(n+3)$, $(n=1,2,\ldots.)$. Then S equals

(a) $\frac{2-x}{(1-x)^3}$ (b) $\frac{2-x}{(1+x)^3}$

(c) $\frac{2+x}{(1-x)^3}$ (d) $\frac{2+x}{(1+x)^3}$

11. ABCD is a rectangle. The points p and Q lie on AD and AB respectively. If the triangles PAQ, QBC and PCD all have the same areas and $BQ=2$, then $AQ=$

(a) $1+\sqrt{5}$ (b) $1-\sqrt{5}$

(c) $\sqrt{7}$ (d) $2\sqrt{7}$

12. For which value of k does the following pair of equations yield a unique solution for x such that the solution is positive?

$x^2-y^2=0$

$(x-k)^2+y^2=1$

(a) 2 (b) 0

(c) $\sqrt{2}$ (d) $-\sqrt{2}$

13. In an examination, the average marks obtained by students who passed was x %, while the average of those who failed was y %. The average marks of all students taking the exam was z %. Find in terms of x, y and z, the percentage of students taking the exam who failed.

(a) $(z-x)/(y-x)$ (b) $(x-z)/(y-z)$

(c) $(y-x)/(z-y)$ (d) $(y-z)/(x-z)$

14. If $a=b^2=c^3=d^4$ then the value of $\log_a(abcd)$ would be :

(a) $\log_a 1+\log_a 2+\log_a 3+\log_a 4$ (b) $\log_a 24$

(c) $1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}$ (d) $1+\frac{1}{2!}+\frac{1}{3!}+\frac{1}{4!}$

15. If three positive real numbers a, b and c $(c>a)$ are in Harmonic Progression, then $\log(a+c)+\log(a-2b+c)$ is equal to:

(a) $2\log(c-b)$ (b) $2\log(a-c)$

(c) $2\log(c-a)$ (d) $\log a+\log b+\log c$

16. Let f be an injective map with domain $\{x, y, z\}$ and range $\{1, 2, 3\}$ such that exactly one of the following statements is correct and the remaining are false. $f(x)=1$, $f(y)\neq 1$, $f(z)\neq 2$. The value of $f^{-1}(1)$ is

(a) x (b) y

(c) z (d) None of the above

17. For constructing the working class consumer price index number of a particular town, the following weights corresponding to different group of items were assigned : Food-55, Fuel-15, Clothing -10, Rent -8 and Miscellaneous-12.

It is known that the rise in food prices is double that of fuel and the rise in miscellaneous group prices is double that of rent. In October 2006, the increased D.A. by a factory of that town by 182% fully compensated for the rise in prices of food and rent but did not compensate for anything else. Another factory of the same locality increased D.A. by 46.5%, which compensated for the rise in fuel and miscellaneous groups.

Which is the correct combination of the rise in prices of food, fuel, rent and miscellaneous groups?

(a) 320. 14, 159.57, 95.64, 166.82 (b) 317.14 , 158.57, 94 .64, 189.28

(c) 311.14, 159.57, 90 .64, 198.28 (d) 321.14, 162.57, 84.46, 175.38

18. In a factory making radioactive substances, it was considered that the three cubes of uranium together are hazardous. So the company authorities decided to have the stack of uranium interspersed with lead cubes. But there is a new worker in a company who does not know the rule. So he arranges the uranium stack the way he wanted. What is the number of hazardous combinations of uranium in a stack of 5?

(a) 3 (b) 7
(c) 8 (d) 10

DIRECTIONS (Q.19-20) : Each of the questions is followed by two statements I and II. Give answer

(a) if the question can be answered by using one of the statements alone, but cannot be answered using the other statement alone.
(b) if the question can be answered by either statement alone.
(c) if the question can be answered by using both statements together, but cannot be answered using either statement alone.
(d) if the question cannot be answered even by using both the statements together.

19. A line graph on a graph sheet shows the revenue for each year from 1990 through 1998 by points and joins the successive points by straight line segments. The point for revenue of 1990 is labeled A, that for 1991 as B, and that for 1992 as C. What is the ratio of growth in revenue between 1991-92 and 1990-91?

Statement I: The angle between AB and X-axis when measured with a protractor is 40 degrees, and the angle between CB and x-axis is 80 degrees.

Statement II: The scale of y-axis is 1 cm = ` 1000.

20. Geetanjali Express, which is 250 metre long when moving from Howrah to Tatanagar crosses Subarnarekha bridge in 30 seconds. What is the speed of Geetanjali Express?

Statement I: Bombay Mail, which runs at 60 km/hour crosses the Subarnarekha bridge in 30 seconds.

Statement II: Bombay Mail when running at 90 km/hour crosses a lamp post in 10 seconds.

SECTION - II (20 - QUESTIONS)

DIRECTIONS (Q. 21 -23) Analyse the passage given and provide an appropriate answer for questions.

Much as an electrical lamp transforms electrical energy into heat and light, the visual 'apparatus' of a human being acts as a transformer of light into sight. Light projected from a source or reflected by an object enters the cornea and lens of the eyeball. The energy is transmitted to the retina of the eye whose rods and cones are activated. The stimuli are transferred by nerve cells to the optic nerve and then to the brain, man is a binocular animal, and the impressions from his two eyes are translated into sight–a rapid, compound analysis of the shape, form, colour, size, position, and motion of the things he sees. Photometry is the science of measuring light. The illuminating engineer and designer employ photometric data constantly in their work. In all fields of application of light and lighting, they predicate their choice of equipment, lamps, wall finishes, colours of light and backgrounds, and other factors affecting the luminous and environmental pattern to be secured, in great part from data supplied originally by photometric laboratory. Today extensive tables and charts of photometric data are used widely, constituting the basis for many details of design. Although the lighting designer may not be called upon to the detailed work of making measurements or plotting data in the form of photometric curves and analyzing them, an understanding of the terms used and their derivation form valuable background knowledge. The perception of colour is a complex visual sensation, intimately related to light. The apparent colour of an object depends primarily upon four factors: its ability to reflect various colours of light, the nature of the light by which it is seen, the colour of its surroundings, and the characteristics and state of adaptation of the eye. In most discussions of colour, a distinction is made between white and coloured objects. White is the colour name most usually applied to a material that diffusely transmits a high percentage of all the hues of light. Colours that have no hue are termed neutral or achromatic colours. They include white, off-white, all shades of gray, down to black. All coloured objects selectively absorb certain wavelengths of light and reflect or transmit others in varying degrees. Inorganic materials, chiefly metals such as copper and brass, reflect light from their surfaces. Hence we have the term "surface" or "metallic" colours, as contrasted with "body" or "pigment" colours. In the former, the light reflected from the surface is often tinted. Most paints, on the other hand, have body or pigment colours. In these, light is reflected from the surface without much colour change, but the body material absorbs some colours and reflects others; hence, the diffuse reflection from the body of the material is coloured but often appears to be overlaid and diluted with a "white" reflection from the glossy surface of the paint film. In paints and enamels, the pigment particles, which are usually opaque, are suspended in a vehicle such as oil or plastic. The particles of a dye, on the other hand, are considereably finer and may be described as colouring matter in solution. The dye particles are more often transparent or translucent.

21. According to the passage, lighting engineers need not
    (a) Plot photometric curves
    (b) Utilize photometric data
    (c) Understand Photometric techniques
    (d) Have mathematical expertise
22. The colour black is an example of
    (a) A surface colour
    (b) An achromatic colour
    (c) An organic colour
    (d) A diffuse colour
23. Paint is an example of a substance containing
    (a) Inorganic material
    (b) Body colours
    (c) Surface colours
    (d) Metallic colours

DIRECTIONS (Qs.24-26): Analyse the passage given and provide an appropriate answer for questions.

Deborah Mayo is a philosopher of science who has attempted to capture the implications of the new experimentalism in a philosophically rigorous way. Mayo focuses on the detailed way in which claims are validated by experiment, and is concerned with identifying just what claims are borne out and how. A key idea underlying her treatment is that a claim can only be said to be supported by experiment if the various ways in which the claim could be as fault have been investigated and eliminated. A claim can only be said to be borne out by experiment, and a severe test of a claim, as usefully construed by Mayo, must be such that the claim would be unlikely to pass it if it were false.

Her idea can be explained by some simple examples. Suppose Snell's law of refraction of light is tested by some very rough experiments in which very large margins of error are attributed to the measurements of angles of incidence and refraction, and suppose that the results are shown to be compatible with the law within those It margins of error. Has the law been supported by experiments that have severely tested it? From Mayo's perspective the answer is "no", because, owing to the roughness of the measurements, the law of refraction would be quite likely to pass this test even if it were false and some other law differing not too much from Snell's law true. An exercise I carried out in my school-teaching days serves to drive this point home. My students had conducted some not very I careful experiments to test Snell's law. I there presented them with some alternative laws of refraction that had been suggested in antiquity and mediaeval times, prior to the discovery of Snell's law, and invited the students to test them with the measurements they had used , to test Snell's law; because of the wide margins of error they had' attributed to their measurements, all of these alternative laws pass the test. This clearly brings out the point that the experiments in question did not constitute a severe test of Snell's law. The law would have passed the test even if it were false and one of the historical alternatives tru(e)

24. Which of the following conclusion can be drawn from the passage?
    (a) Precise measurement is a sufficient condition to ensure validity of conclusions resulting from an experiment.
    (b) Experimental data might support multiple theoretical explanations same time, hence validity of theories needs to be tested further.
    (c) Precise measurement is both a necessary and sufficient condition to ensure validity of conclusions resulting from an experiment.
    (d) Precise measurement along with experimenter's knowledge of the theory underpinning the experiment is sufficient to ensure the validity of conclusions drawn from experiments.
25. As per Mayo's perspective, which of the following best defines the phrase "scientific explanation"?
    (a) One which is most detailed in its explanation of natural phenomena.
    (b) One which survives examinations better than other explanations.
    (c) One which has been thoroughly tested by scientific experts.
    (d) One which refutes other explanations convincingly,
26. The author's use of Snell's law of refraction to illustrate Mayo's perspective can best said to be
    (a) Contrived
    (b) Premediated
    (c) Superfluous
    (d) Illustrative

DIRECTIONS (Q 27-29) : Analyse the passage given and provide an appropriate answer for questions.

An expert group has sounded a timely warning on what 'environmentally destructive tourism' will mean to national parks and wildlife sanctuaries and the objectives they are supposed to serve. Given the unique and rare wildlife the country has been endowed with, the rationale for using the resources for attracting tourists from abroad is unassailable. This necessarily postulates that the flora and the fauna should be protected and conserved. As a matter of fact, much of the government's interest in wildlife preservation has to do with the

tremendous prospect of tourist traffic on that account. Yet the risk of the revenue-earning motivation overrunning the conservation imperatives is very real, the lure of the coveted foreign exchange that goes with this business only, is serving to enhancing it several folds. Even with the tourist inflow far below the potential, the pressure of visitors is said to have been already felt on the tiger reserves. With the Government of India's declared intent to boost tourism quite justified for its own reasons, the need for eliminating the risk assumes a greater sense of urgency. The study team has noted that most of the 41 national parks and 165 wildlife sanctuaries surveyed are open to the tourists. The less frequented among them may not require special attention immediately in this respect as much as the ones that are major tourists attraction do. These include the Sanjay Gandhi National Park in Maharashtra, Nandankanan in Orissa and Bannerghatta in Karnataka. Over a year ago, the Indian Board for Wildlife expressed concern over the looming danger, and decided that the core areas of national parks and sanctuaries should be kept totally free from biotic disturbances, and the vistor be permitted to view the wildlife only from the areas marked out for the purpose. And now, the expert group has come up with the suggestion that a case by case evaluation be done of the 'capacity' as well as the 'limitations' of all the national parks and wildlife sanctuaries and based on such assessment an area-specific plan for tourist promotion within the 'safety' norms be charted. That this is the most scientific way of going about the job, and that there is no time to lose can be readily conceded.

27. Biotic disturbances in the context means
- (a) Attacks from other living things, animals, etc.
- (b) The disturbances caused by the natives on seeing the strange foreigners.
- (c) The political disturbances causing the closedown of the parks.
- (d) Disturbances caused by the wild animals on seeing the tourists.

28. By using the expression "environmentally destructive tourism"the author means
- (a) The preservation of the wild beasts.
- (b) Destruction of the wildlife and sanctuaries.
- (c) Destroying the attractive sources of wild animals and birds.
- (d) The maintenance of the flora and fauna of the country.

29. To implement the most scientific ways of tourism, we should
- (a) Get industries and talented persons trained in the field.
- (b) From a commission and plan out how to implement the suggestions.
- (c) Send a group of scientists abroad to learn more about tourism.
- (d) Speed as much finance as possible to better the suggestions made.

DIRECTIONS (Q. 30-31) : Select the most appropriate word(s) from the given choice to fill in the blank(s).

30. Justice Minister Bola Ige, confronted with the general incivility of local police, placed a _____on the cads. Said the Hon. Bola Ige, " I pray that God will make big holes in their pockets."
- (a) malediction
- (b) sanction
- (c) proscription
- (d) plea

31. During the heated discussion, the leader of the group _____ refuted all the claims brought by his opponents. Later everybody acknowledged that he survived by most _____ luck.
- (a) ingeniously, incredible
- (b) ingeniously, incredulous
- (c) ingenuously, incredible
- (d) ingenuously, incredulous

32. Choose the option that points out sentence(s) with grammatical error(s).
- I. I love the man dancing on the table.
- II. I love the man's dancing on the table.
- III. In 1986 Elie Wiesel was named the Nobel Peace Prize recipient, an honour established by Alfred Nobel.
- IV. Neither of the recommendations works as well as we thought they would.
- V. Either the Minister or the Minister's wife will have to excuse themselves from the reception to speak to the caterer

(a) III and V
(b) I and IV
(c) II and V
(d) III and IV

DIRECTIONS (Q.33- 34) : For the word given at the top of each table, match the dictionary definitions on the left (A, B, C, D) with their corresponding usage on the right (E, F, G, H). Out of the four possibilities given in the boxes below the table, select the one that has all the definitions and their usages correctly matched.

33. Infer

Dictionary Definition	Usage
A. To derive by reasoning or implication	E. We see smoke and infer fire
B. To surmise	F. Given some utterance,a listener may infer from it all sorts of things which neither the utterance nor the utterer implied
C. To point out	G I waited all day to meet him. From this you can infer my zeal to see him.
D. To hint	H. She did not take part in the debate except to ask a question inferring that she was not interested in the debate.

(a) A – G; B – E; C – H; D – F
(b) A – F; B – H; C – E; D – G
(c) A – H; B – G; C – F; D – E
(d) A – E; B – F; C – G; D – H

34. Catch

Dictionary definition	Usage
A Capture	E All her friends agreed that Prasad was a good catch.
B Grasp with senses or mind	F The proposal sounds very good but where is the catch?
C Deception	G Hussain tries to catch the spirit of India in this painting
D Thing or person worth trapping	H Sorry, I couldn't catch you

(a) A – H; B – F; C – E; D – G
(b) A – F; B – G; C – E; D – H
(c) A – G; B – F; C – E; D – H
(d) A – G; B – H; C – F; D – E

DIRECTIONS (Qs. 35-36) : Please choose the correct alternative that can go into the sentence in the blank space to make a coherent sentence:

35. The _____ of the country should take a greater interest in promoting the indigenous works that are rooted in the deep traditions of scholarship across the world.
(a) LITERATI
(b) LITERATE
(c) LITERATURE
(d) LITERAL

36. _____ of different categories of problems often leads to design of improper solutions that fail to address the complexities of the problem.
(a) CONFABULATION
(b) CONFLATION
(c) CONFLICT
(d) CONFESSION

DIRECTIONS (Qs. 37 -38) : Mark the correct option, which puts the parts of the sentence in right order :

37. I. But she gained courage as she went on
II. She was a little nervous about it just at first
III. and opened their eyes and mouths so very wide
IV the two creatures got so close to her, one on each side.
(a) IV, III, II, I
(b) II, IV, III, I
(c) II, I, IV, III
(d) None of the above

38. I. It would perhaps be possible for him to be of some use to this brave girl
II. he said to himself, vaguely at first, that
III. without neglecting anything of what was due to his important mission.
IV. and this idea pleased him
(a) II, III, I, IV
(b) III, II, I, IV
(c) I, III, II, IV
(d) None of the above

DIRECTIONS (Qs 39-40) : Below are the words followed by prepositions. Find out which set(s) is/are incorrect.

39. I. Indict to II. Intrigue on III. Endow with IV. Trample on
(a) I and IV (b) I and III (c) I, III and IV (d) None of the above

40. I. Trace to II. Sparing of III. Replete with IV. Wonder at
(a) I and III (b) I, II and III (c) II, III and IV (d) None of the above

SECTION - III (20 - QUESTIONS)

DIRECTIONS (Qs. 41-45) : The data given below pertains to seven different industry sector with respect to income, expenditure, Profits. Study the data and answer the questions.

	Particulars	chemical	Diversified	Electricity	Food	Machinery	Services	Textiles
1	Sales	498,476	128,125		82,808			56,401
2	Other Income	7,303		2,374		2,887	6,097	1,705
3	**Total Income=(1+2)**		**130,830**			**128,733**		**58,106**
4	Raw material cost	338,683	78,237	31,060	48,188	54, 994	81,600	33,738
5	Power & fuel expenses	18,467		4,865	2,003	1,973		
6	Salaries and wages	13,791	4,412		4,284	20,038	44,371	4,361
7	Depreciation	11,065	4,807	6,311		5,026	22,854	3,013
8	Interest payments	11,135	2,923	5,756			133,619	5,259
9	Other expenses		24,706	5,604	23,570	34,271	97,092	10,368
10	**Total expenses =(4+5+6+7+8+9)**		**119,316**	**58,769**	**80,750**	**120,557**	**385,694**	
11	Profit before tax =(3–10)		11,514		3,814	8,176	50,484	
12	Tax paid	7,467		2,394				0
13	**Profit after tax =(11–12)**	19,861	8,887	8,501	2,538	5,001	32,698	–2,874

41. Which of the following statements is wrong ?
(a) Depreciation expense is the lowest for food industry
(b) Power and fuel expenses are 5th largest item in the expenditure of diversified industries.
(c) Electricity industry earns more of other income as a percentage of total income compared to other industries.
(d) Raw material cost is the largest item of expense in all industry sectors

42. Depreciation as a percentage of total expenses is maximum in which industry sector ?
(a) Chemical (b) Diversified
(c) Electricity (d) Machinery

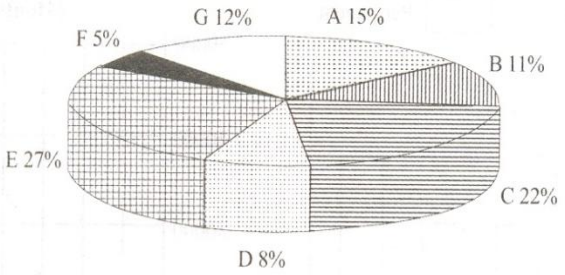
43. Which industry sector has 'salaries and wages' as 3rd largest item in its expenses?
(a) Food (b) Services
(c) Textiles & Food (d) Food & Machinery

44. If the industry sectors are ranked on the basis of 'Tax paid as a proportion of sales' in the ascending order, then which industry will be placed at rank 3?
(a) Machinery (b) Electricity
(c) Food (d) Diversified

45. If the ranking is based on Profit Before Tax in the descending order, subject to the condition that 'other expenses' of all the industry sectors equals zero, then which of following statements is wrong?
(a) Rank of Chemical industry does not change (b) Rank of electricity industry declines
(c) Diversified industry rank changes from 3rd to 4th (d) Rank of food industry changes from 5th to 6th

DIRECTIONS (Qs. 46 -50) : Seven companies A, B, C, D, E, F and G are engaged in production of two items I and II. The comparative data about production of these items by the seven companies is given in the following Graph and Table. Study them carefully to answer the questions that follow.

PERCENTAGE OF THE TOTAL PRODUCTION PRODUCED BY THE SEVEN COMPANIES



Cost of the total production (both items together) by seven companies = ` 25 crores

RATIO OF PRODUCTION BETWEEN ITEMS I AND II AND THE PERCENT PROFIT EARNED FOR THE TWO ITEMS

	Ratio of Production		Percent Profit Earned	
Company	Item I	Item II	Item I	Item II
A	2	3	25	20
B	3	2	32	35
C	4	1	20	22
D	3	5	15	25
E	5	3	28	30
F	1	4	35	25
G	1	2	30	24

46. Cost of production of item I by company F is what percent of the cost of production of item II by company D?

(a) 16% (b) 33.33%

(c) 66.67% (d) None of these

47. What is the total profit earned by company G for items I and II together?

(a) ` 78 lakh (b) ` 1.62 crore

(c) ` 7.8 crore (d) ` 16.2 lakh

48. What is the ratio of the cost of production of item I by company A to the cost of production of item I by company D?

(a) 3 : 5 (b) 1 : 2

(c) 2 : 1 (d) 2 : 3

49. The cost of production of both items together by company E is equal to the total cost of production of both items together by which of the two companies?

(a) C and D (b) B and G

(c) A and D (d) C and F

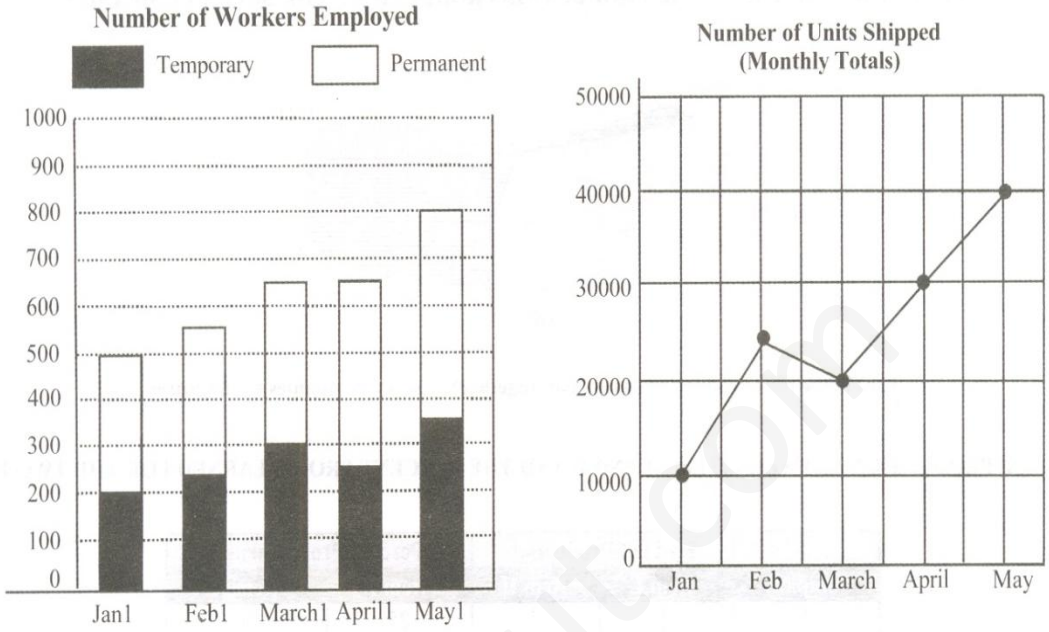
50. What is the total of the cost of production of item I by company A and the cost of production of item II by company B?

(a) ` 2.6 crore (b) ` 26 lakh

(c) ` 3.35 crore (d) ` 33.65 lakh

DIRECTIONS (Qs. 51 - 54): Study the following bar graph and line graph giving details of 'Number of Workers Employed' and 'Number of Units Shipped' respectively of M/s Mega Corp Limited to answer these questions.

M/s Mega Corp Limited : Number of Workers Employed and Units Shipped



51. By what per cent did the number of temporary workers employed by M/s Mega Corp Limited increase from April 1 to May 1?
(a) 40% (b) 25%
(c) 20% (d) 12%

52. What was the difference, if any, between the number of permanent workers employed by M/s Mega Corp Limited on March 1 and the number of permanent workers employed on April 1?
(a) 0 (b) 50
(c) 100 (d) 150

53. What was the total number of units shipped by M/s Mega Corp Limited for the months of January, February and March (approximately)?
(a) 40,000 (b) 55,000
(c) 60,000 (d) 70,000

54. If on May 1, 60% of the permanent workers and 40% of the temporary workers employed by M/s Mega Corp Limited were women, how many of the workers employed by M/s Mega Corp Limited at that time were women?
(a) 200 (b) 120
(c) 410 (d) 260

DIRECTIONS (Qs. 55-56) : These questions are based on the following information

IT School of Management is a management institute involved in teaching,training and research. Currently it has 37 faculty members. They are involved in three jobs: teaching, training and research. Each faculty member working with IT School of Management has to be involved in at least one of the three jobs mentioned above:

- A maximum number of faculty members are involved in training. Among them, a number of faculty members are having additional involvement in the research.
- The number of faculty members in research alone is double the number of faculty members involved in all the three jobs.
- 17 faculty members are involved in teaching. The number of faculty members involved in teaching alone is less than the number of faculty members involved in research alone.
- The faculty members involved in the teaching are also involved in at least one more job.

55. After sometime,the faculty members who were involved in all the three tasks were asked to withdraw from one task. As a result, one of the faculty members each opted out of teaching and research, while remaining ones involved in all the three tasks opted out of training. Which one of the following statements, then necessarily follows:

(a) The least number of faculty members is now involved in teaching.
(b) More faculty members are now associated with training as compared to research.
(c) More faculty members are now involved in teaching as compared to research.
(d) None of the above

56. Based on the information given above, the minimum number of faculty members involved in both training and teaching, but not in research is:

(a) 1 (b) 3
(c) 4 (d) 5

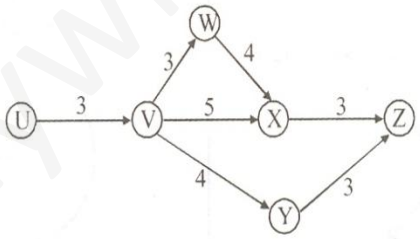
57. Read the following directions carefully and answer the question. You should tick

(a) If any one of the statements alone is sufficient to answer the question
(b) If both statements individually are sufficient to answer the question
(c) If both statements together are required to answer the question
(d) If both statements are not sufficient to answer the question

There are four racks numbered 1,2,3,4 and four books numbered 1,2,3,4. If an even rack has to contain an odd numbered book and an odd rack contains an even numbered book then what is the position of book 4?

(I) Second book has been put in third rack
(II) Third book has been put in second rack

Directions (Qs. 58-59) : The following network gives details about the various activities carried out in a bottling firm for their latest project and the time required for each activity. The average cost incurred in each activity is 5 times the square of the duration of the activity. If the organisation wants to reduce the duration of any particular activity, in addition to the average cost, it will have to incur an amount equal to 15 times the cube of the new duration of the activity.



58. The completion of one cycle of the network results in one bottle ready to be sold in the market. The project involves a total of 800 bottles. What is the average cost of the entire project?

(a) Rs. 74400 (b) Rs. 372000
(c) Rs. 15000 (d) Rs. 18500

59. If profit is defined as the difference between the selling price and the average cost, and each bottle is sold for Rs. 510, what is the approximate percent profit earned by the firm?

(a) 5% (b) 10%
(c) 15% (d) 17.5%

60. Among Anil, Bibek, Charu, Debu and Eswar, Eswar is taller than Debu but not as fat as Debu. Charu is taller than Anil but shorter than Bibek. Anil is fatter than Debu but not as fat as Bibek. Eswar is thinner than Charu, who is thinner than Debu. Eswar is shorter than Anil. Who is the thinnest person?

(a) Bibek (b) Charu
(c) Debu (d) Eswar

Answer Sheet

1	(d)
2	(a)
3	(c)
4	(b)
5	(c)
6	(c)
7	(a)
8	(d)
9	(c)
10	(a)
11	(a)
12	(c)
13	(a)
14	(c)
15	(c)
16	(b)
17	(b)
18	(c)
19	(a)
20	(c)
21	(a)
22	(b)
23	(b)
24	(c)
25	(b)
26	(d)
27	(d)
28	(c)
29	(b)
30	(a)

31	(a)
32	(d)
33	(d)
34	(d)
35	(a)
36	(b)
37	(b)
38	(a)
39	(d)
40	(d)
41	(d)
42	(c)
43	(d)
44	(c)
45	(d)
46	(d)
47	(a)
48	(c)
49	(d)
50	(a)
51	(a)
52	(b)
53	(b)
54	(c)
55	(d)
56	(a)
57	(a)
58	(b)
59	(b)
60	(d)

Section I

Quantitative Analysis & Data Interpretation

Directions (*Q. Nos.* 1-10) *Select the correct alternative from the given choices.*

1. The values of the numbers 2^{2004} and 5^{2004} are written one after another. How many digits are there in all?
(a) 4008 (b) 2003
(c) 2004 (d) None of these

2. Rajat draws a 10×10 grid on the ground such that there are 100 identical squares numbered 1 to 100. If he has to place two identical stones on any two separate squares in the grid, how many distinct ways are possible?
(a) 2475 (b) 4950 (c) 9900 (d) 1000

3. Mohan is a carpenter who specialises in making chairs. For every assignment he undertakes, he charges his commission and cost. His commission is fixed and equals ₹ 560 per assignment while the cost equals ₹ $2n^2$ where, n is the total number of chairs he makes. If for a certain assignment the average cost per chair is not more than ₹ 68, then the minimum and maximum possible numbers of chairs in the assignment are, respectively.
(a) 13 and 19 (b) 13 and 20
(c) 14 and 19 (d) 14 and 20

4. Let $f_{n+1}(x) = f_n(x) + 1$ if n is a multiple of $3 = f_n(x) - 1$ otherwise.
If $f_1(1) = 0$, then what is $f_{50}(1)$?
(a) -18 (b) -16
(c) -17 (d) Cannot be determined

5. On a plate in the shape of an equilateral triangle ABC with area $16\sqrt{3}$ sq cm, a rod GD, of height 8 cm, is fixed vertically at the centre of the triangle. G is a point on the plate. If the areas of the triangles AGD and BGD are both equal to $4\sqrt{19}$ sq cm, find the area of the triangle CGD (in sq cm).
(a) $3\sqrt{19}$ (b) $4\sqrt{19}$
(c) $12\sqrt{3}$ (d) None of these

6. Vaibhav wrote a certain number of positive prime numbers on a piece of paper. Vikram wrote down the product of all the possible triplets among those numbers. For every pair of numbers written by Vikram, Vishal wrote down the corresponding GCD. If 90 of the numbers written by Vishal were prime, how many numbers did Vaibhav write?
(a) 6 (b) 8
(c) 10 (d) Cannot be determined

7. Two cars A and B start from two points P and Q respectively towards each other simultaneously. After travelling some distance, at a point R, car A develops engine trouble. It continues to travel at 2/3rd of its usual speed to meet car B at a point S where $PR = QS$. If the engine trouble had occurred after car A had travelled double the distance it would have met car B at a point T where $ST = SQ/9$. Find the ratio of speeds of A and B.
(a) 4 : 1 (b) 2 : 1 (c) 3 : 1 (d) 3 : 2

8. There are two water drums in my house whose volumes are in the ratio 1 : 5. Every day the smaller drum is filled first and then the same pipe is used to fill the bigger drum. Normally by the time I return from my college, *i. e.*, at 1 : 30 pm, the smaller drum would just be full. But today I returned a little early and started drawing water from the well with the help of a bucket,

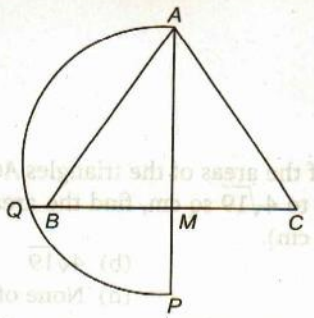
poured one-third into the smaller drum and the remaining into the bigger drum. I continued this till the smaller drum was filled. Immediately after that, I shifted the pipe into the bigger drum and went for lunch. Today if the bigger drum was filled in 12 min before its normal time, when was the smaller drum full?

(a) 1 : 18 pm
(b) 1 : 28 pm
(c) 1 : 26 pm
(d) Cannot be determined

9. Let S_n denote the sum of the squares of the first n odd natural numbers. If $S_n = 533n$, find the value of n.

(a) 18 (b) 20
(c) 24 (d) 30

10. In the figure alongside, ΔABC is equilateral with area S. M in the mid-point of BC and P is a point on AM extended such that $MP = BM$. If the semi-circle on AP intersects CB extended at Q and the area of a square with MQ as a side is T, which of the following is true?



(a) $T = \sqrt{2}S$ (b) $T = S$
(c) $T = \sqrt{3}S$ (d) $T = 2S$

Directions (*Q. Nos.* 11-12) *These questions are based on the following data.*

One morning, Govind Lal the owner of the local petrol bunk, was adulterating the petrol with kerosene. He had two identical tanks-the first was full of pure petrol while the second was empty. First he transferred an arbitrary amount of petrol from the first tank into the second and then replaced the petrol removed from the first tank with kerosene. He then repeated this process one more time but this time he ensured that by the end of the process the second tank was exactly full.

11. Which of the following can be the concentration of petrol in the second tank?

(a) 50% (b) 60%
(c) $66\frac{2}{3}\%$ (d) 80%

12. If the concentration of petrol in the second tank is 75% and the cost price of kerosene is half that of petrol, then what is Govind Lal's net profit percentage on selling the contents of the second tank given that he claims to sell the petrol at a profit of 25%?

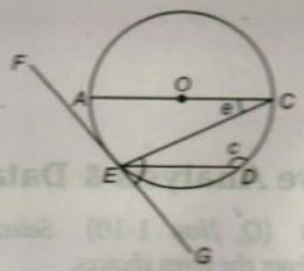
(a) $42\frac{6}{7}\%$ (b) $66\frac{2}{3}\%$
(c) $83\frac{1}{3}\%$ (d) 100%

Directions (*Q. Nos.* 13-17) *Select the correct alternative from the given choices.*

13. Auto fare in Bombay is ₹ 2.40 for the first 1 km, ₹ 2.00 per km for the next 4 km and 1.20 for each additional km thereafter. Find the fare in rupees for k km ($k \geq 5$).

(a) $2.4k + 1.2(2k - 3)$
(b) $10.4 + 1.2(k - 5)$
(c) $2.4 + 2(k - 3) + 1.2(k - 5)$
(d) $10.4 + 1.2(k - 4)$

14. In the figure alongside, O is the centre of the circle and AC the diameter. The line FEG is tangent to the circle at E. If $\angle GEC = 52°$, find the value of $\angle e + \angle c$.



(a) 154° (b) 156°
(c) 166° (d) 180°

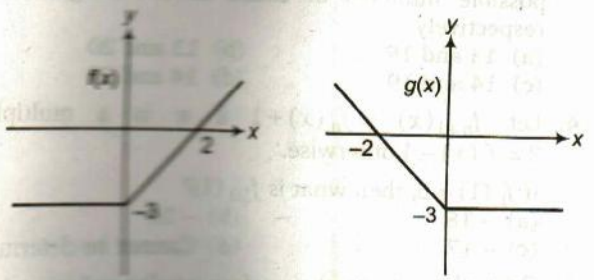
15. Rekha drew a circle of radius 2 cm on a graph paper of grid 1 cm × 1 cm. She then calculated the area of the circle by adding up only the number of full unit-squares that fell within the perimeter of the circle. If the value that Rekha obtained was d sq cm. less than the correct value, then find the maximum possible value of d?

(a) 6.28 (b) 7.28
(c) 7.56 (d) 8.56

16. In the above question what is the minimum possible value of d?

(a) 4.56 (b) 5.56
(c) 6.56 (d) 3.56

17. The graphs given alongside represent two functions $f(x)$ and $g(x)$ respectively. Which of the following is true?



(a) $g(x) = |f(x)|$ (b) $g(x) = f(-x)$
(c) $g(x) = -f(x)$ (d) None of these

Directions (*Q. Nos.* 18-19) *These questions are based on the following data.*

A is standing 5 m East and 4 m North of a point *P* while *B* is standing 15 m East and 24 m North of *P*. *A* walks at a speed of 1.4 m/s while *B* walks at a speed of 2.1 m/s.

18. If *A* and *B* simultaneously start walking towards each other and finally meet at a point *Q*, then find the distance *PQ*.

(a) 13 m (b) $12\sqrt{3}$ m

(c) 15 m (d) $13\sqrt{2}$ m

19. If *A* and *B* simultaneously start walking East and South respectively, then which of the following is true of the distance of closest approach 'd_1' between them?

(a) $d_1 > 5$ m

(b) $d_1 < 5$ m

(c) $d_1 = 5$ m

(d) Cannot be determined

Directions (*Q. Nos.* 20-21) *For these questions, consider the function given by* $f(x) = |x - 1| - x$

20. What is the area of the traingle bounded by the graph of the given function with the coordinate axis given by $x = 0$ and $y = 0$?

(a) 2 (b) 1/4

(c) 1/2 (d) 1

21. Which of the following is not true about the graph of $f(x)$?

(a) A portion of the graph is parallel to the line $y = 25$.

(b) A portion of graph is in 2nd quadrant.

(c) Some portion of graph lies in 1st quadrant.

(d) Some portion of graph lies in 3rd quadrant.

Directions (*Q. Nos.* 22-24) *Study the following table and answer the questions that follow.*

Disbursement of Loans by Various Banks from 1982 to 1986 (In ₹ Crore)

Banks	1982	1983	1984	1985	1986
A	18	23	45	30	70
B	27	33	18	41	37
C	29	29	22	17	11
D	31	16	28	32	43
E	13	19	27	34	42
Total	118	120	140	154	203

22. In which year did the average disbursement of loans record the highest percentage increase over that of the previous year?

(a) 1984 (b) 1986

(c) 1985 (d) 1983

23. In which year and for which bank was the percentage contribution to the total value of loans disbursed for that year the lowest?

(a) C, 1986 (b) B, 1984

(c) C, 1985 (d) A, 1985

24. For a certain scheme, the qualification is that a bank should have consistently achieved a minimum of 20% of the total disbursement of all banks for each of the last four years. Which of the banks qualify as on the year 1986?

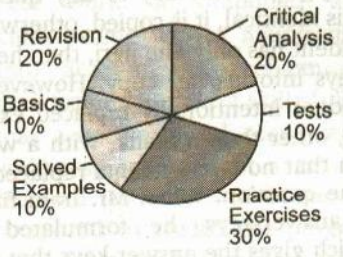
(a) A (b) B

(c) C (d) None of these

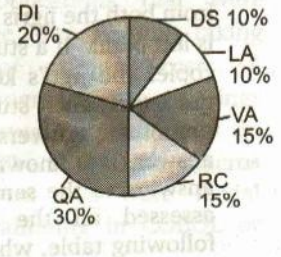
Directions (*Q. Nos.* 25-27) *Answer these questions on the basis of the information given below.*

Each of the following pie charts gives the percentage split up of the total time spent by a certain student towards preparation of CAT 2005.

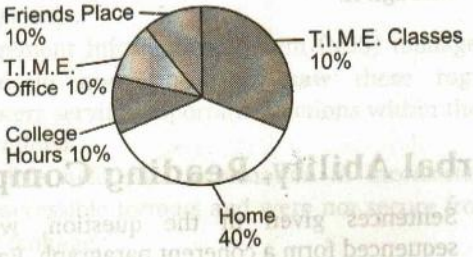
Split up by Nature of Study



Split up by Area of Study



Split up by Place of Study



25. If atleast 5% of the time spent on each area of study was spent on solved examples of that area, then the time spent on solved examples in any area of study, as percentage of the total time spent on that area of study, is at most.

(a) $21\frac{1}{6}\%$ (b) 30%

(c) $38\frac{1}{3}\%$ (d) 55%

26. The number of areas of study for which the cirtical analysis was done at friends' place alone is atmost

(a) 2 (b) 3

(c) 5 (d) 6

27. At the most what percentage of total time was spent on test taken in VA and LA?

(a) 10% (b) 20%

(c) $66\frac{2}{3}\%$ (d) 100%

Directions (*Q. Nos.* 28-30) *Answer these questions on the basis of the information given below.*

When Munna Bhai joined the university of South Ghatkopar for his M.S., Mr. Irani, his professor, asked him to prove his calibre in a test conducted for the entire class. The class comprised of exactly 10 students. The test contain exactly 10 multiple choice type questions. However, Munna as is always the case, managed to get the correct answer-key for all the 10 questions well before the exam. But in the exam, he wrongly marked exactly one question, on purpose, to avoid raising any suspicion. All the other nine students of the class also formed their respective answer-keys in the following manner. They first obtain the answer-key from one or two of the students, who are called his/her jigris, who already have their answer keys. If a student has two jigris, then he/she first compares the answer keys from both the jigris. If the key to any question from both the jigris is identical, it is copied, otherwise it is left blank. If a student has only one jigri, then he/she copies the jigri's keys into his/her copy. However, in the exam, each student intentionally replaced exactly one of the answers, other than a blank, with a wrong answer. It is known that no two students replaced the answers to the same question. When Mr. Irani finally assessed all the answer-keys, he formulated the following table, which gives the answer-keys that each of the ten students marked for the 10 questions- I through X.

Student \ Question No.	I	II	III	IV	V	VI	VII	VIII	IX	X
Arun	b	a	-	b	c	-	-	a	c	b
Chinky	a	a	-	d	c	-	-	-	c	b
Jassi	b	-	d	d	c	b	d	a	d	b
Lucky	b	a	-	d	c	b	-	b	c	b
Munna	b	a	b	d	c	b	d	a	c	b
Niran	b	a	d	d	c	b	d	a	c	b
Praveen	b	a	b	d	c	b	c	a	c	b
Rahul	b	c	d	d	c	b	d	a	c	b
Ritesh	b	a	-	d	s	b	-	-	c	b
Sastry	b	a	d	d	c	a	d	a	c	b

28. Munna is the jigri of
(a) Sastry and Ritesh (b) Niran and Praveen
(c) Lucky and Rahul (d) Jassi and Lucky

29. Who among the following is not the jigri of any of the ten students?
(a) Jassi (b) Praveen
(c) Lucky (d) Rahul

30. Who are the jigris of Chinky?
(a) Niran and Rahul
(b) Rahul and Sastry
(c) Sastry and Lucky
(d) Cannot be determined

Section II

Verbal Ability, Reading Comprehension and Logical Reasoning

31. Sentences given in the question, when properly sequenced form a coherent paragraph. Each sentence is labeled with a letter. Choose the most logical order of sentences from among the four given choices to construct a coherent paragraph.
(A) Paucity of serious thought is no surprise in the government, but one would have thought that the considerably educated PM, who at one time did research of some quality, would have tried to answer for his own satisfaction how effective reservation policies have been.
(B) In his approach to Pakistan, he has gone about enthusiastically looking for out of the box solutions.
(C) Assuming that he came to the above conclusion-it is hard to imagine how he would come to any other?
(D) My question is why should they be confined to the Pak policy only? SC/ST's deserve them more.
(a) ABCD (b) CDBA (c) DABC (d) ACBD

32. Sentences given in the question, when properly sequenced form a coherent paragraph. Each sentence is labeled with a letter. Choose the most logical order of sentences from among the four given choices to construct a coherent paragraph.
(A) Overcoming the handicap of crushing poverty, he has had a phenomenal run thus far.
(B) Soon enough, the mentor faced exploitation charges, with a government agency taking objection to the manner on which the boy's grooming is being handled.
(C) When his widowed mother was reportedly on the verge of giving up on it all, a martial arts coach descended on stage like a deux ex machina.
(D) The controversy even found its way to the court.
(a) ACDB (b) BDAC (c) ACBD (d) BACD

33. In the given question, all the sentences except one sentence, when properly sequenced form a coherent paragraph. Each sentence is labeled with a letter. Choose the sentence which does not form a part of the paragraph from among the four given choices.
(A) The revolution called Human Relations is quieter but more profound and is sweeping through U.S. industry.
(B) Gradually, men felt themselves swallowed by a vast, impersonal machine, which rubbed away their self-respect and, in a way, their identities.

(C) In anger against betrayal of the human spirit by the Industrial Revolution, million of workers listened to the false promises of Marx's philosophy.
(D) The Industrial Revolution, replaced the tools of the independent workmen with machines, had transformed handicraftsmen who were their own bosses into hired hands subject to the orders of managers.

(a) A (b) B
(c) C (d) D

34. Each question consists of sentences, which have one or two blanks, each blank indicating that something has been omitted. Below each sentence are four numbered words or sets of words labelled (A) through (D). Choose the set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

A.....statement is an.....comparison; it does not compare things explicitly, but suggests, a likeness between them.

(a) sarcastic...unfair
(b) blatant...overt
(c) metaphorical...implied
(d) sanguine...inherent

35. The question given below consists of a sentence which is divided into four parts, numbered (A) through (D). Only one part in the sentence is not acceptable in standard written English. Identify that part in the sentences which contains the error.

(a) Her acceptance of speech
(b) Was well received
(c) Eliciting thunderous applause
(d) At several points

36. In the following question, four different sentences are given. Chooose the option that contains the grammatically incorrect sentence/s.

I. He is feeling that this relocation is nothing but the kick upstairs.
II. Consensus is now emerging at our state and national levels.
III. A more and more rigorous circle is formed from which one is more and more unlikely to escape.
IV. It happened up on a system that worked.

(a) I, IV (b) I, II, III
(c) I, III, IV (d) I, III

37. Given below are sentences, each using the question word different ways. Identify the sentence which uses the question word in a grammatically incorrect manner.

Happen

(a) Accept it, mistakes will happen
(b) It happened on a system that worked
(c) I promise nothing will happen to you
(d) If so happens I'm going your way

38. Given below are sentences, each using the question word different ways. Identify the sentence which uses the question word in a grammatically incorrect manner.

Gut

(a) The fire gutted the building
(b) The prisoner's letters were gutted by heavy censorship
(c) The famous stars spills his guts in his autobiography
(d) Climbing that cliff takes a lot of guts

39. Given below is a paragraph whose last line is missing. Choose the line which completes the paragraph most logically from the options given below.

The real change in corporate culture began with the personal computer. With the PC, any empolyee could have a computer of his or her very own and use if for real work. It simplified applications that were cumbersome with a mainframe even without taking into account the problem of gaining access. A mainframe required a skilled programmer to do things that a non-technical user eventually could easily do with a spreadsheet on a PC. The forms and macros required to solve problems on PCs were trivial compared to traditional programming in COBOL or other computer languages.

(a) Soon PCs were ubiquitous among managers and professionals.
(b) Management Information System (MIS) managers reacted in horror as they saw these rogue computers serving important functions within their corporations.
(c) These PCs held vital information in inconsistent and inaccessible formats and were not secure from loss or damage.
(d) Eventually, MIS departments connected PCs to their corporate mainframes, but primarily as replacements for dumb terminals. Some users, however, were more creative.

40. Given below is a paragraph whose last line is missing. Choose the line which completes the paragraph most logically from the options given below.

So the unpleasant shocks that used to affect other people now affect us. Few of us have not been touched on the shoulder lightly or, in some cases, heavily, by the hand of failure. A dozen or more years ago, failure was for the untalented, or the unlucky. Today, no one is safe.

(a) It is a strange irony that while changes in fortune are now more personal, other changes have become less so.
(b) This, ofcourse, applies to services as well as products.

(c) Constantly improving products and services is an intrinsic part of staying in business.
(d) Another is the fact that there are more scientists alive today than ever lived in the history of the world.

41. Given below is a paragraph whose last line is missing. Choose the line which completes the paragraph most logically from the options given below.

The remake the world (including Nature), Fourier mobilised : an intolerance (for civilisation), a form (classification), a standard (pleasure), an imagination (the 'scene'), a discourse (his book), all of which pretty well define the action of the signifier or the signifier in action. This action continually makes visible on the page a glaring lack, that of science and politics, that is, of the signified.

(a) What Fourier lacks points is return to what we ourselves lack when we reject Fourier : to be ironic about Fourier is always even from the scientific point of view to censure the signifier.
(b) However, the relationship of Desire and Need is not complementary were they fitted one into the other, everything would be perfect, but supplementary; each is the excess of the other.
(c) The excess : what does not pass through.
(d) The vomiting of politics is what Fourier calls Invention.

Passage-I

Directions (*Q. Nos.* 42-50) *Read the paragraphs given below and answer the questions that follows.*

The Nostradamus fad might have been just that, a short-lived blip that would evaporate when the next big thing came along. And it might have been dismissed as nothing more than a few whackos' nutty obsession with doomsday. But a lot of un-nutty Japanese take it seriously and it's influence has persisted for nearly three decades. The most alarming development occurred when certain cults including Shoko Asaharas Aum got in the act. Aum which allegedly masterminded the deadly sarin gas attacks to attract followers already bitten by the Nostradamus bug. Other groups did likewise while also providing avenues for surviving doomsday.

Writers like Goto fanned a sense of fear. The books sells but they do not have any answer and the cult steps in and generates followers in mere sensationalism.

These days Nostradamus has become such an ingrained part of Japanese pop culture that most people are well versed with his doomsday scenario. Even many skeptics pause to consider his predictions when confronted with the real world dangers. Ever since pyongyang sent a missile flying over Japan last August, North Korea has been considered as the most plausible source of apocalyptic of the yen, Martina Hingis loss at Wimbledon would suffice among the faithful as evidences that Nostradamus was on to something.

This fever in Japan tends to skew towards young people like 18 year old Inoue, who wanted to feel as if she had achieved something before the world ends. The goal she decided would be to create fashion. She promoted beach clothes, cosmetics and drugs that would enhance a woman's bust. Here it is not sure whether she was using Nostradamus to promote a career in marketing And she is a perfect example of how fact and fantasy can coexist in today's Japan. Nishimoto on other hand has made full preparations and needs no convincing. He has outfitted his home in Habikino, a suburb of Osaka with a personal bomb shelter. It has 30 cm thick concrete walls reinforced with steel escape hathes, a hand cranked battery operated generator and a ventilation system that pumps in air while filtering out radioactive elements and biological and chemical contaminants.

42. What is the author's view on Japan?
(a) People in Japan are great believers of Nostradamus
(b) People of Japan depend on sensationalism
(c) Fact and fantasy coexist in Japan
(d) Both (b) and (c)

43. "Here it is not sure whether she was using Nostradamus to promote a career in marketing." What is the underlying tone in this line?
(a) Appreciation (b) Sarcasm
(c) Criticism (d) Both (a) and (b)

44. Which of the following can be implied from the passage?
(a) Nostradamus' prophecies have been influencing the people of Japan for the past thirty years.
(b) Nostradamus' prophecies have been the inspiration for various pop songs in Japanese.
(c) Nostradamus' predicted about korean missile, Hingis would lose, weakness of the yen and the European chicken.
(d) (a) and (b)

45. What according to the passage is probably the most deadly effect of the Nostradamus fad?
I. Silliness of the Japanese people.
II. The sarin gas attack.
III. The cult culture that demands blind following.
IV. Sensationalism that generates a lot of followers.
(a) I only (b) II, III and IV
(c) II only (d) All of these

Passage-II

"Let me," cried Shakespeare's Julius Caesar, "have men about me that are fat, sleek-headed men and such assleep o' nights." One can see his point. There is something infinitely reassuring about a rounded, even cherubic, countenance: something sound and trustworthy about a man of bulk.

Now this may, of course, be merely an optical illusion. But the lean and hungry look does not, in general,

inspire confidence. Perhaps that's why, when a fat man is proved to be a villain, he's very villainous indeed.

We feel sadly let down.

Ramblings such as this occurred to me in considering the case of the television presenter. In recent weeks the nature of my work has brought me face to face with many forms of the genus interlocutor. As you know, they come in many shapes and sizes. Any consideration of their merits must begin with the visual impression that they make. Let us disregard the disembodied ones, the out-of-vision narrators, those known in the trade as "voice-overs". Our business is with the front men and women in corporeal view, upon the producer pins all his hopes of an audience joining and staying with his product. And, while it's a television truism that the strengths of a chat show or a magazine is often the stength of its weakest link, it's equally true that a presenter can make or mar the best-intentioned programme.

It is no easy task. Far too often presenters and producers forget that the Box is essentially an intimate medium. It is not a market place, nor a Speaker's Corner. And as in those two public arenas the louder the voice the more strident the appeal, the more dubious appear the goods for sale. No, your good presenter must get on intimate terms with his viewer-singular, not plural. He may in numerical terms be talking to millions but it is still a one-to-one business.

So, the essence of the craft is the quiet, conversational buttonholing of the viewer. This is precisely the point at which good TV Presentation Parts company with show business. Introducing the next item or personality in a steady crescendo of spurious excitement is no more than rabble rousing, to elicit audience applause. Often what follows falls flat on its face, despite the bolstering of audience reaction, for the viewer at home is solitary, before his set.

The ground rules of presentation are pretty obvious-a friendly face and manner, a persona one can like on first impression or warm to as the one-way conversation continues. It was no accident that the archetypal presenter, Richard Dimbleby, was so good at his job. He was a large man, voice and personality projected effortlessly into the home.Always the keynote was a quiet sincerity. In a lighter fashion, the ever-green Cliff Michelmore continues the tradition. He's another rounded person, in several senses, with whom the viewer finds instant rapport. Of course, there are dangers in the large personality. It can be allowed to grow so that it fills the screen, allowing only a peep over the shoulder of the famous front man at what the programme's really about.

46. What is the "optical illusion" referred to in the passage?
(a) A Rounded man looking villainous
(b) A Rounded man looking hungry
(c) A Rounded man looking cherubic
(d) A Rounded man looking more trustworthy than the lean man

47. How can an interlocutor be 'disembodied'?
(a) Because the telecasts are poor.
(b) Because the frames are edited haphazard.
(c) Because the viewer never sees them physically.
(d) None of the above

48. What are the two public arenas referred to by writer?
(a) Market place and speakers corner
(b) Television and presentations
(c) Interlocution and television
(d) Political speech and presenters on television

Passage-III

Last November, I organized a seminar about terrorism in aviation. In order to drive home the potential hazards to the students, we visited a large eastern U.S airport with the intention of acting like a terrorist group looking for targets of opportunity. What we discovered was, at times fascinating and at other frightening.

In general US airports have two areas where the visitors have access : a a public area with little active security measures and a more secure area in the airport waiting and boarding areas. The less secure areas usually contain ticket counters, baggage claim, gift shops, restaurants and other airport services. Getting into the main areas involves going through a screening process that includes X-ray inspection of carry-on items and walking through metal detectors. Other security measures include limiting curbside parking at the terminal, securing unattended luggage and requiring that all passengers be identified by the airlines by use of a picture identification. In the academic exercise, the group made several notable security observations.

Most of the trash bins in the terminal areas were set within larger concrete containers. An explosive set within one of these containers would likely be directed upward. However, in several cases there were metal and fiberglass containers, sometines adjacent to the concrete ones; also located around the terminal.

During visit, there were numerous announcements about how unttended baggage would be collected by the airport authority. At one point, our party observed an unattended umbrella propped against a wall near one of the screening areas. The umbrella was plain in view and in close proximity to constant foot traffic. It was over 45 minutes before an airport staff member removed the umbrella. Most areas of the terminal were designed such that it was difficult to leave a bag unattended in heavily travelled areas of the terminal without it being seen. Our group specifically observed custodial staff going about their duties to see they were security conscious.

In general, we were quite impressed with the level of security. The most worrisome aspects of what we saw were that the effectivenesss of active and passive security measures varied greatly, and that a group of

people unschooled in the ways of terrorism could very quickly discover numerous opportunities for committing mayhem without being detected.

49. Which statement is correct?
(a) Ticket countries are more secure than boarding areas.
(b) Boarding areas are as secure as ticket counters.
(c) Boarding areas are less secure than ticket counters.
(d) Boarding areas are more secure than ticket counters.

50. Which statement/s is/are incorrect?
I. US airports have two insecure areas where the visitors have access.
II. The effectiveness of active and passive security measures varied greatly.
III. The US airport authorities were quick in collecting the unattended baggage.
(a) Only I (b) I, II
(c) I, III (d) None of these

51. Given a and $b = a - b$; a and b but $c = a + c - b$; a or $b = b - a$; a but not $b = a + b$; find 1 or (2 but not (3 or (4 and 5 but (6 but not (7 and (8 or 9)))))).
(a) 9 (b) -8
(c) -11 (d) 17

Directions (*Q. Nos.* 52-55) *These questions are based on the following data.*
Consider the following operators defined below
$x @ y$: gives the positive difference of x and y.
$x \$ y$: gives the sum of the squares of x and y.
$x £ y$: gives the positive difference of the squares of x and y.
$x \& y$: gives the product of x and y.
Also, $x, y \in R$ and $x \neq y$. The other standard algebraic operations are unchanged.

52. Given that $x @ y = x - y$, then find $(x \$ y) + (x £ y)$.
(a) $2x^2$
(b) $2y^2$
(c) $2(x^2 + y^2)$
(d) Cannot be determined

53. The expression $[(x £ y) + (x @ y)]^2 - 2(x £ y)$ will be equal to
(a) $x £ y$ (b) $x \$ y$
(c) $(x £ y)(x @ y)$ (d) Cannot be determined

Directions (*Q. Nos.* 54-56) *These questions are based on the data given below*

On the eve of a special function in view of 'National Integration', seven participants – *A, B, C, D, E, F* and *G*, are to be accommodated in two rooms, each room having a capacity of four persons only. For the allocation, the following conditions must be considered.
(i) *A*, a Gujarati, also speak Tamil and Bengali.
(ii) *B* and *F* are both Bengali and speak only that language
(iii) *C*, a Gujarati, also speaks Tamil.
(iv) *D* and *G* are Tamilians and speak only Tamil.
(v) *E*, a Gujarati, also speaks Bengali.
(vi) Bengalis and Tamilians refuse to share their rooms with each other.

Further, it is necessary for each participant in a room to be able to converse with at least one other participant in the same room, in at least one language.

54. Which of the following combinations of participants in a room will satisfy all conditions for both the rooms?
(a) *B, C, F* (b) *C, D, F, G*
(c) *A, D, E, G* (d) *D, G, C, E*

55. What is the total number of various combinations of room-mates possible, which satisfy all the conditions mentioned?
(a) 2 (b) 3
(c) 4 (d) 5

56. If another participant, *H*, is to join the group, then he can be placed with any of the following, except
(a) *B, E* and *F*, if *H* is a Bengali
(b) *C, D* and *G*, if *H* is a Tamilian
(c) *B, E* and *F*, if *H* is a Tamilian
(d) *A, B* and *F*, if *H* is a Gujarati

Directions (*Q. Nos.* 57-58) *These questions are based on the data given below.*

Three trains-Rajdhani Express, Shatabdi Express and Taj Mahal Express-travel between two stations without stopping anywhere in between. No two trains have the same starting station or the same terminating station or the same travel fare. Also, the following known about these trains.
(i) The fare for the train which travels between Chennai and Pune is ₹ 1650.
(ii) Taj Mahal Express runs between Delhi and Mumbai.
(iii) Fare for the train which travels between Bengaluru and Agra is ₹ 750 less than the fare for Taj Mahal Express.
(iv) The fare for Rajdhani Express is ₹ 150 less than the fare for Taj Mahal Express.

57. What is the fare for Shatabadi Express?
(a) ₹ 1650
(b) ₹ 1800
(c) ₹ 1050
(d) Cannot be determined

58. Which among the following statements is definitely true?
(a) The fare for Shatabdi Express which, travels between Bengaluru and Agra is ₹ 1800.
(b) The fare for Taj Mahal Express, travels between Delhi and Mumbai is ₹ 1050.
(c) The fare for Rajdhani Express, which travels between Chennai and Pune is ₹ 1650.
(d) None of the above

Directions (*Q. Nos.* 59-60) *These questions are based on the data given below.*

In a recently held test series consisting of three matches-I, II and III, five players-Sehwag, Ganguly Tendulkar, Dravid and Laxman, are the top five scoring batsmen, not necessarily in the same order.

(i) No two players scored the same number of runs in any match.

(ii) Sehwag scored more runs than Ganguly in the 1st and 2nd matches.

(iii) The player who scored the highest runs in the 3rd match scored the least runs in the 1st match.

(iv) Dravid scored more runs than Laxman but less runs than Tendulkar in the 2nd match. Tendulkar scored more runs than Laxman in the 1st match. Laxman scored more runs than Ganguly but less than Dravid in the 3rd match.

(v) Tendulkar scored the lowest runs in one match and in two matches his position in the decreasing order of the runs scored by the batsmen is same. He was not the top scorer in any of the three matches.

59. Among the given five players, who scored the least number of runs in the 3rd match?

(a) Sehwag (b) Ganguly
(c) Tendulkar (d) Cannot be determined

60. If Tendulkar scored more runs than Ganguly in the 2nd match, then who is the second highest scorer in the 1st match?

(a) Sehwag (b) Laxman
(c) Dravid (d) None of these

ANSWER KEY

1. d
2. b
3. c
4. c
5. c
6. a
7. c
8. c
9. b
10. b
11. d
12. a
13. b
14. c
15. d
16. b
17. b
18. c
19. b
20. b
21. d
22. b
23. a
24. d
25. d
26. c
27. c

28. b
29. a
30. c
31. d
32. c
33. a
34. c
35. a
36. a
37. b
38. c
39. a
40. a
41. a
42. c
43. b
44. a
45. d
46. d
47. c
48. a
49. d
50. c
51. a
52. d
53. b
54. d
55. c
56. c
57. c
58. c

59. c
60. d

Time : 150 Minutes **MM : 180**

General Instructions

1. All questions are compulsory.
2. Each correct answer carry 3 marks, each incorrect answer carry –1 mark and unattempted questions carry no marks.

Section I

Quantitative Ability & Data Interpretation

Directions (Q. Nos. 1-10) *Select the correct alternative from the given choices.*

1. Consider a sequence S whose nth term T_n is defined as $1 + 3/n$, where $n = 1, 2, \ldots$ Find the product of all the consecutive terms of S starting from the 4th term to the 60th term.

(a) 1980.55
(b) 1985.55
(c) 1990.55
(d) 1975.55

2. Let $P = \{2, 3, 4, \ldots, 100\}$ and $Q = \{101, 102, 103, \ldots, 200\}$. How many elements of Q are there such that they do not have any element of P as a factor?

(a) 20 (b) 24
(c) 23 (d) 21

3. What is the sum of all the 2-digit numbers which leave a remainder of 6 when divided by 8?

(a) 612 (b) 594
(c) 324 (d) 872

4. Which of the terms $2^{1/3}, 3^{1/4}, 4^{1/6}, 6^{1/8}$ and $10^{1/12}$ is the largest?

(a) $2^{1/3}$ (b) $3^{1/4}$
(c) $4^{1/6}$ (d) $10^{1/12}$

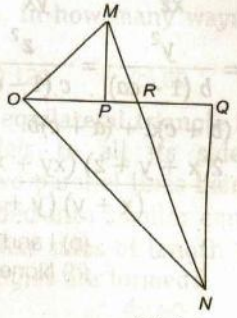
5. If the roots of the equation $(a^2 + b^2)x^2 + 2(b^2 + c^2)x + (b^2 + c^2) = 0$ are real, which of the following must hold true?

(a) $c^2 \geq a^2$ (b) $c^4 \geq a^2 (b^2 + c^2)$
(c) $b^2 \geq a^2$ (d) $a^4 \leq b^2 (a^2 + c^2)$

6. Find the remainder of 2^{1040} divided by 131.

(a) 1 (b) 3
(c) 5 (d) 7

7. In the figure below, $\angle MON = \angle MPO = \angle NQO = 90°$ and OQ is the bisector of $\angle MON$ and $QN = 10$, $OR = 40/7$. Find OP.



(a) 4.8 (b) 4.5
(c) 4 (d) 5

8. If $(a^2 + b^2)$, $(b^2 + c^2)$ and $(a^2 + c^2)$ are in geometric progression, which of the following holds true?

(a) $b^2 - c^2 = \frac{a^4 - c^4}{b^2 + a^2}$ (b) $b^2 - a^2 = \frac{a^4 - c^4}{b^2 + c^2}$

(c) $b^2 - c^2 = \frac{b^4 - a^4}{b^2 + a^2}$ (d) $b^2 - a^2 = \frac{b^4 - c^4}{b^2 + a^2}$

9. p is a prime and m is a positive integer. How many solutions exist for the equation $p^6 - p = (m^2 + m + 6)(p - 1)$?

(a) 0 (b) 1
(c) 2 (d) Infinite

10. A certain number written in a certain base is 144. Which of the following is always true?

I. Square root of the number written in the same base is 12.

II. If base is increased by 2, the number becomes 100.

(a) Only I (b) Only II
(c) Neither I nor II (d) Both I and II

11. A rectangle is drawn such that none of its sides has length greater than 'a'. All lengths less than 'a' are equally likely. The chance that the rectangle has its diagonal greater than 'a' is (in terms of %)

(a) 29.3% (b) 21.5%
(c) 66.66% (d) 33.33%

12. If x is a real number, $[x]$ is greatest integer less than or equal to x, then $3|x| + 2 - [x] = 0$. Will the above equation have any real root?

(a) Yes
(b) No
(c) Will have real roots for $x < 0$
(d) Will have real roots for $x > 0$

13. If $a = \frac{x}{y+z}$, $b = \frac{y}{z+y}$, $c = \frac{z}{x+y}$, then which of the following statements is/are true?

I. $\frac{b+c-1}{yz} + \frac{a+c-1}{xz} + \frac{a+b-1}{yx} = 1$

II. $\frac{x^2}{a(1-bc)} = \frac{y^2}{b(1-ca)} = \frac{z^2}{c(1-ab)}$

III. $(a+b)c + (b+c)a + (a+c)b = \frac{2(x+y+z)(xy+xz+yz) - 6xyz}{(x+y)(y+z)(z+x)}$

(a) I and II (b) I and III
(c) II and III (d) None of these

14. If α and β are the roots of the quadratic equation $x^2 - 10x + 15 = 0$, then find the quadratic equation whose roots are $\left(\alpha + \frac{\alpha}{\beta}\right)$ and $\left(\beta + \frac{\beta}{\alpha}\right)$

(a) $15x^2 + 71x + 210 = 0$
(b) $5x^2 - 22x + 56 = 0$
(c) $3x^2 - 44x + 78 = 0$
(d) Cannot be determined

Directions (Q. Nos. 15-17) *Read the information carefully and answer the questions follow that.*

A cricket tournament had three teams - India, Australia and Sri Lanka taking part in it. The format of the tournament was such that in the preliminary stage each of these teams, would play the other teams four times. Four points are awarded for a win and in case a team beats another team by a huge margin, it is given a bonus point in addition to the four points. At the end of the preliminary stage, the top two teams, in terms of the points scored, reaches the finals. No match in the tournament ends in a tie and if two teams end up with the same number of points at the end of the preliminary stage, the team with the better net run rate is placed higher.

15. If India reached the finals, then what is the minimum number of points it would have scored in the preliminary stage?

(a) 8 (b) 10
(c) 12 (d) 16

16. If Sri Lanka was eliminated in the preliminary stage, then what is the maximum number of points it could have scored?

(a) 12 (b) 14
(c) 16 (d) 20

17. If Australia had the highest number of points at the end of the preliminary stage, then atleast how many points did it have?

(a) 16 (b) 17
(c) 18 (d) 20

18. A vessel has a milk solution in which milk and water are in the ratio 4 : 1. By addition of water to it, milk solution with milk and water in the ratio 4 : 3 was formed. On replacing 14 L of this solution with pure milk the ratio of milk and water changed to 5 : 3. What is the volume of the water added?

(a) 12 L (b) 60 L
(c) 32 L (d) 24 L

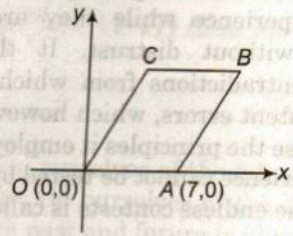
19. A car A starts from a point P towards another point Q. Another car B starts (also from P) 1 h after the first car and overtakes it after covering 30% of the distance PQ. After that, the cars continue. On reaching Q, car B reverses and meets car A, after covering $23\frac{1}{3}$ of the distance QP. Find the time taken by car B to cover the distance PQ (in hours).

(a) 3 (b) 4
(c) 5 (d) $3\frac{1}{3}$

20. A, B and C can independently do a work in 15 days, 20 days and 30 days, respectively. They work together for some time after which C leaves. A total of ₹ 18000 is paid for the work and B gets ₹ 6000 more than C. For how many days did A work?

(a) 2 (b) 4
(c) 6 (d) 8

21. In the figure given, $OABC$ is a parallelogram. The area of the parallelogram is 21 sq units and the point C lies on the line $x = 3$. Find the coordinates of B.



(a) (3, 10) (b) (10, 3)
(c) (10, 10) (d) (8, 3)

22. Find the complete set of values that satisfy the relations $||x| - 3| < 2$ and $||x| - 2| < 3$.

(a) $(-5, 5)$ (b) $(-5, -1) \cup (1, 5)$
(c) $(1, 5)$ (d) $(-1, 1)$

23. If $ax^2 + bx + c = 0$ and $2a$, b and $2c$ are in arithmetic progression, which of the following are the roots of the equation?

(a) a, c (b) $-a, -c$
(c) $-\frac{a}{2}, -\frac{c}{2}$ (d) $-\frac{c}{a}, -1$

24. A solid sphere of radius 12 inches is melted and cast into a right circular cone whose base diameter is $\sqrt{2}$ times its slant height. If the radius of the sphere and the cone are the same, how many such cones can be made and how much material is left out?

(a) 4 and 1 cubic inch (b) 3 and 12 cubic inches
(c) 4 and 0 cubic inch (d) 3 and 6 cubic inches

25. If $\log_x (a - b) - \log_x (a + b) = \log_x (b / a)$, find $\frac{a^2}{b^2} + \frac{b^2}{a^2}$.

(a) 4 (b) 2 (c) 3 (d) 6

26. Letters of the word "ATTRACT" are written on cards and are kept on a table. Manish is asked to lift three cards at a time, write all possible combinations of the three letters on a piece of paper and then replace the three cards. The exercise ends when all possible combinations of letters are exhausted. Then, he is asked to strike out all words in his list, which look the same when seen in a mirror. How many words is he left with?

(a) 40 (b) 20
(c) 30 (d) None of these

27. S is a set given by $S = \{1, 2, 3, \ldots, 4n\}$, where n is a natural number. S is partitioned into n disjoint subsets $A_1, A_2, A_3, \ldots, A_n$ each containing four elements. It is given that in everyone of these subsets there is one element, which is the arithmetic mean of the other three elements of the subsets. Which of the following statements is then true?

(a) $n \neq 1$ and $n \neq 2$
(b) $n \neq 1$ but can be equal to 2
(c) $n \neq 2$ but can be equal to 1
(d) It is possible to satisfy the requirement for $n = 1$ as well as for $n = 2$

28. When asked for his taxi number, the driver replied, "If you divide the number of my taxi by 2, 3, 4, 5, 6 each time you will find a remainder of one. But, if you divide it by 11, the remainder is zero. You will also not find any other driver with a taxi having a lower number who can say the same". What is the taxi number?

(a) 121 (b) 1001 (c) 1881 (d) 781

29. A student is asked to form numbers between 3000 and 9000 with digits 2, 3, 5, 7 and 9. If no digit is to be repeated, in how many ways can the student do so?

(a) 24 (b) 120 (c) 60 (d) 72

30. The side of an equilateral triangle is 10 cm long. By drawing parallels to all its sides, the distance between any two parallel lines being the same. The triangle is divided into smaller equilateral triangle, each of which has sides of length 1 cm. How many such small triangles are formed?

(a) 60 (b) 90
(c) 120 (d) None of these

Section II

Verbal Ability, Reading Comprehension and Logical Reasoning

Directions (Q. Nos. 31-32) *Each of the following questions has a paragraph from which a sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.*

31. RD Laing developed a broad range of thought on interpersonal psychology. This deals with interactions between people, which he considered important, for an ethical action always occurs between one person and another. In books such as *The Politics of Experience*, he deal with issues concerning how we should relate to persons labelled by the psychiatric establishment as "schizophrenic".

(a) He came to be seen as a champion for the rights of those considered mentally ill

(b) He spoke out against (and wrote about) practices of psychiatrists which he considered inhumane or barbaric, such as electric shock treatment

(c) Laing also did work in establishing true asylums as places of refuge for those who feel disturbed and want a safe place to go through whatever it is they want to explore in themselves and with others

(d) He suggested that the effects of psychiatric drugs (some of which are very deleterious, such as tardive diskensia) be called just that: "effects" and not be referred to by the preferred euphemisms of the drug companies, who prefer to call them "side effects"

32. Jurisprudence is the theory and philosophy of law. Students of jurisprudence aim to understand the fundamental nature of law and to analyse its purpose, structure and application. Jurisprudential scholars (sometimes confusingly referred to as "jurists") hope to obtain a deeper understanding of the law, the kind of power that it exercises and its role in human societies.

They seek a deeper understanding behind law's seemingly unpredictable and uncertain nature.

(a) At a practical level, some jurists hope to improve society by studying what the Law is, what it ought to be, and how it actually operates

(b) A common starting point in understanding jurisprudence is the objective of law to achieve justice

(c) Hence, the arguable scientific nature of jurisprudence

(d) Jurisprudence seeks to draw on unrestricted elements of life and the world to aid the critical study of law

Directions (Q. Nos. 33-35) *Read the following passage corefully and answer the questions based on that.*

Human reason, in one sphere of its cognition, is called upon to consider questions, which it cannot decline, as they are presented by its own nature but which it cannot answer, as they transcend every faculty of the mind.

It falls into this difficulty without any fault of its own. It begins with principles which cannot be dispensed within the field of experience and the truth and sufficiency of which are, at the same time insured by experience. With these principles it rises, in obedience to the laws of its own nature, to ever higher and more remote conditions. But it quickly discovers that in this way, its labours must remain ever incomplete because new questions never cease to present themselves and thus it finds itself compelled to have recourse to principles which transcend the region of experience while they are regarded by common sense without distrust. It thus falls into confusion and contradictions from which it conjectures the presence of latent errors, which however, it is unable to discover because the principles it employs transcending the limits of experience cannot be tested by that criterion. The arena of these endless contests is called Metaphysic.

Time, when she was the queen of all the sciences and if we take the will for the deed, she certainly deserves, so far as regards the high importance of her object-matter, this title of honour.

33. According to the author, 'Metaphysic' is best defined when human reason

(a) becomes conscious of the presence of latent errors

(b) solves pending old questions, tackles new ones that arise

(c) employs principles that transcend the limits of experience

(d) rises to higher and more remote conditions

34. If there were a paragraph succeeding the last, it would probably be about

(a) the rise of Metaphysic into the realm of popular acclaim

(b) Metaphysic as the final solution to human misery

(c) the modern day contempt for metaphysical reasoning

(d) the subjugation of science by a transcendental human consciousness

35. The passage provides an answer to which of the following questions?

(a) How does experience limit the human mind's recourse to principles in combating new questions that present themselves?

(b) Why does human reason restrain its forays to within its known limitations?

(c) How does the human mind attempt to resolve problems beyond its scope?

(d) None of the above

Directions (Q. Nos. 36-40) *Find the incorrect usage of the word in the following questions*

36. SLAM

(a) I heard the door slam behind him

(b) She slammed down the phone angrily

(c) She slammed his face hard

(d) The ear skidded and slammed into a tree

37. STOP

(a) The car stopped at the traffic light

(b) Shantaram immediately stopped what he was doing

(c) We need more laws to stop pollution

(d) He is stopped by law from holding a licence

38. TIME

(a) I can remember very few times when we had to cancel due to ill health

(b) This is the first time that I have been to London

(c) The train arrived right on time

(d) The changing seasons mark the passing of time

39. SOMBRE

(a) He was dressed in sombre shades of grey and black

(b) Paul was in a sombre mood

(c) The year ended on a sombre note

(d) He is in the sombre position of not having to worry about money

40. CALL

(a) She payed him a call from the pay phone near her home

(b) I will call on you tomorrow evening at 7 pm

(c) Vikram decided to call a meeting to discuss the trade fair

(d) She felt the call of religion early in her life

Directions (Q. Nos. 41-47) *Read the following passage carefully and answer the questions that follow.*

Passage 1

It is essential to rid ourselves of the false impressions of time, which our human limitations seem to impose upon us. Above all, we must rid ourselves of the belief that the future is in some way less determined than the past, if the borderline between past and future is illusory, then so must be the distinction between the two regions of time which it is supposed to separate. The only reason we believe the future to be still undecided while the past is immutable is that we can remember the one and not the other. To avoid these prejudices we must picture the history of the universe not as a three-dimensional stage on which things change but as a static four-dimensional space time structure of which we are a part. We believe that events are not real until they "happen", whereas in reality past, present and future are all frozen in the four dimensions of space time. Unfortunately even if all this is accepted, we have to continue using the language of a "moving" time, for we have no other but we must try to interpret this language always as a description of the unchanging space time structure of the universe.

Contemplating the history of the universe in this way, it is attractive to believe that the periods of expansion and contraction could be related to each other by symmetry. Both points of view merit serious consideration and that we cannot say with any certainty that the contracting universe will or will not, differ fundamentally from the expanding phase that we observe today.

41. According to the author of the passage,

(a) the time value called 'now' is most essential to the understanding of the universe

(b) the impression of a moving time is not a false imposition of human limitation

(c) there is noting with respect to which time could move

(d) the future is better determined than the past

42. Which of the following best exemplifies the author's attitude to time?

(a) The impression of a moving time is false

(b) 'Now' is a purely subjective phenomenon existing only within the human mind

(c) The future is not in any way less determined than the past

(d) All of the above

Passage 2

Amidst the increasing clamour for a discourse on educational improvement, on budgetary allocations and retention rates, there is one crucial question which is insufficiently discussed. And the question is this: what is the purpose of education today? At various times, over the past 100 yr, that question has been answered differently - in colonial India, the official answer would have been, "to create a cadre of clerks and officials to run the colonial state", while in a newly decolonized India, the official answer could be, "to create a nationalist sensibility and the national citizen."

Today, I suspect the official answer to the question about the purpose of education would be, "to give people jobs." Increasingly, the emphasis in education is towards vocationalisation and skills development. In a recent private conversation, the Education Minister of a North Indian state said, "we have a lot of jobs. We just don't have the people skilled enough to do them. We need bio-technologists, fitters, crane operators, nurses and lab assistants. But our education does not prepare young people for what we need. We need to change that."

Similarly, we find that the Confederation of Indian Industry is showing increasing interest in school education. The CII recently commissioned a study to look at the challenges and opportunities which face the Indian industry and this is its thesis that in the year 2025, there will be about 40 million jobs worldwide, which need to be filled. India will be one of the few countries in the world to have a labour surplus of the right age group. It, therefore believes that we need to think about the kinds of education system necessary to develop skills whereby our children will be best equipped to function in this scenario.

Public consensus on the way to improve educational access is increasingly moving towards a public-private partnership. But we must be concerned about the terrible narrowness of the vision for educational improvement which characterizes our discourse. Education, in this picture, is about the implanting of useful skills - the assumption being that it will ultimately lead to both personal and national enrichment but as Martha Nussbaum writes, education is not simply a producer of wealth; it is a producer of citizens. Citizens in a democracy need, above all, freedom of mind - to learn to ask searching questions; to reject shoddy historical argument; to imagine alternative possibilities from a globalizing, service and market-driven economy, to think what it might be like to be in others' shoes. Recently, the Israeli novelist, Amos Oz, spoke about the importance of reading novels as what he calls an antidote to hate. He said, "I believe in literature as a bridge between peoples. I believe curiosity can be a moral quality. I believe imagining the other can be an antidote to fanaticism. Imagining the other will make you not only a better businessperson or a better lover but even a better person. Part of the tragedy between Jew and Arab is the inability of so many of us, Jews and Arabs, to imagine each other—really imagine each other; the loves, the terrible fears, the anger, the passion. There is too much hostility between us, too little curiosity."

The skills and thought processes which engender the curiosity, the imagining are associated with the humanities, the arts and literature and despite the splendid interventions in the NCERT's new textbooks for History and Political Science, these areas are terribly neglected. Our dominant conception of worthwhile education is increasingly technical and mechanistic. The thinking processes engendered by the social sciences are today seen as quaint, vaguely lefty-intellectual, a kind of quixotic idealism - which has very little to do with the real business of life. It is a strange irony that in the educational world of Gandhi, Tagore and Aurobindo, there are tragically few voices which assert a more holistic vision.

43. The true purpose of education in India as inferred from the passage

(a) is to create a nationalist sensibility in every citizen
(b) has been a topic of debate since independence
(c) is a concept that has been changing from time to time
(d) is to teach an individual the necessary skills to earn his livelihood

44. In the author's perception, our vision for educational improvement is narrow because our system

(a) gives importance only to vocationalisation and skills development
(b) believes in making people earn more so that they can stand up to the challenges of a globalizing economy
(c) does not acknowledge the importance of humanist concepts
(d) does not support a public-private partnership in improving educational access to everyone

45. Amos Oz believes that the world will become a peaceful place, if people

(a) become less hostile
(b) become less narrow minded
(c) become less fanatic
(d) empathise with each other

46. The Indian concept of worthwhile education is that which

I. gives technical training.

II. makes people think.

III. has a measurable outcome.

IV. kindles our curiosity and imagination.

V. helps people become wealthy.

(a) I and V (b) II and III
(c) I, II and IV (c) I, III and IV

47. Which of the following is not an attribute of a good citizen in a democracy?

(a) Learning to ask searching questions
(b) Mot accepting inadequate reasons from history
(c) Thinking out of the box
(d) Learning to negotiate with people

Directions (Q. Nos. 48-51) *Read the following information carefully and answer the questions based on that.*

Two teams of five each must be selected from a group of ten persons-A through J-of which A, E and G are doctors; D, H and J are lawyers; B and I are engineers; C and F are managers. It is also known that

(i) every team must contain persons of each of the four professions.

(ii) C and H cannot be selected together.

(iii) I cannot be selected into a team with two lawyers.

(iv) J cannot be in a team with two doctors.

(v) A and D cannot be selected together.

48. If C and G are in different teams, then who are the other team members of A?

(a) C, D, E and I (b) B, F, I and J
(c) B, C, H and J (d) F, H, I and G

49. Who among the following cannot be in the same team as I?

(a) H (b) J
(c) C (d) F

50. Who among the following must always be in the same team as A?

(a) D (b) B
(c) H (d) J

51. If F and G are in the same team, which among the following statements is true?

(a) B and H will in the other team
(b) E and I must be in the same team
(c) H must be in the same team but B must in the other team
(d) C must be in the other team but D must be in the same team

Directions (Q. Nos. 52-55) *Read the following information carefully and answer the questions based on that.*

Two families are planning to go on a canoe trip together. The families consist of the following people: Robert and Mary Henderson and their three sons Tommy, Don and William, Jerome and Ellen Penick and their two daughters Kate and Susan.

There will be three canoes with three people in each canoe. Atleast one of the four parents must be in each canoe. Atleast one person from each family must be in each canoe.

52. If the two mothers ride together in the same canoe and the three brothers each ride in a different canoe, which of the following must be true?

(a) Each canoe has both males and females in it
(b) One of the canoes has only females in it
(c) One of the canoes has only males in it
(d) The sisters ride in the same canoe

53. If Ellen and Susan are together in one of the canoes, which of the following could be a list of the people together in another canoe?

(a) Dan, Jerome, Kate
(b) Dan, Jerome, William
(c) Dan, Kate, Tommy
(d) Jerome, Kate, Mary

54. If Jerome and Mary are together in one of the canoes, each of the following could be a list of the people together in another canoe except

(a) Dan, Ellen, Susan
(b) Ellen, Robert, Tommy
(c) Ellen, Susan, William
(d) Ellen, Tommy, William

55. If each of the Henderson children rides in a different canoe, which of the following must be true?

I. The Penick children do not ride together.

II. The Penick parents do not ride together.

III. The Henderson parents do not ride together.

(a) Only I (b) Only II
(c) I and II (d) I and III

Directions (Q. Nos. 56-57) *Each question gives a sentence with a part of the sentence underlined that may contain an error. Four alternative substitutes are given for the underlined portion. Identify the choice that replaces the underlined part to form a logically and grammatically correct statement and mark its number as your answer.*

56. Feminism is not simply a movement to ensure that women will have equal rights with men but that a commitment for eradicating the ideology of domination that permeates Indian culture at various levels

(a) that is a commitment to eradicate the ideology to dominate that

(b) it is a commitment to eradicating the ideology of domination that

(c) whose commitment to eradicating the ideology of domination which

(d) but that a commitment for eradicating the ideology of domination that

57. It is unfortunate that the lure of visiting foreign countries still draws a very large number of our people, who do not seem to be realizing what their own country is and how much can be seen and learnt from it?

(a) Who do not seem to realize their country and see and learn from it

(b) Who are not realizing what their own country is and how much there is in it to see and learn from

(c) Who do not seem to realize what their own country is and how much there is in it to see and learn from it

(d) Who do not seem to realize what their own country is and how much there is in it to see and learn from

Directions (Q. Nos. 58-60) *Read the following information carefully and answer the questions based on that.*

Each of five people—A, B, C, D and E owns a different car among Maruti, Mercedes, Sierra, Fiat and Audi and the colours of these cars are Black, Green, Blue, White and Red, not necessarily in that order. No two cars are of the same colour. It is also known that

(i) A's car is not Black and it is not a Mercedes.
(ii) B's car is Green and it is not a Sierra.
(iii) E's car is not White and it is not an Audi.
(iv) C's car is a Mercedes and it is not Blue.
(v) D's car is not Red and it is a Fiat.

58. If A owns a Blue Sierra, then E's car can be a

(a) Red Maruti (b) White Maruti
(c) Black Audi (d) Red Audi

59. If A owns a White Audi, then E's car can be a

(a) Red Maruti (b) Blue Maruti
(c) Green Audi (d) Black Sierra

60. If A's car is a Red Maruti and D's car is White, then E owns a

(a) Black Audi (b) Blue Sierra
(c) Black Sierra (d) Blue Audi

ANSWER KEY

1. b
2. d
3. b
4. d
5. a
6. a
7. c
8. b
9. b
10. d
11. b
12. b
13. a
14. c
15. a
16. d
17. b
18. c
19. d
20. d
21. b
22. b
23. d
24. c
25. d
26. a
27. b

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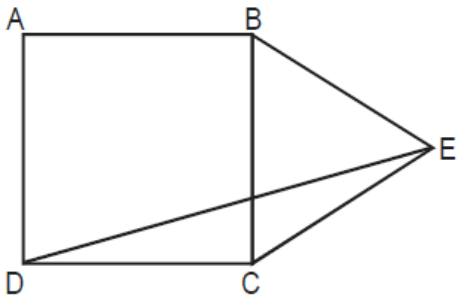
28. a
29. d
30. d
31. a
32. a
33. b
34. c
35. c
36. c
37. d
38. a
39. d
40. a
41. c
42. d
43. c
44. a
45. d
46. a
47. d
48. d
49. b
50. c
51. c
52. a
53. b
54. b
55. d
56. b
57. d
58. a

59. d

60. b

CAT 2014 based paper

1. If ABCD is a square and BCE is an equilateral triangle, what is the measure of angle∠DEC?
a. 15° b. 30° c. 20° d. 45°



2. Instead of a metre scale, a cloth merchant uses a 120 cm scale while buying, but uses an 80 cm scale while selling the same cloth. What is his overall profit percentage?
a. 50% b. 25% c. 40% d. 15%

3. From a circular sheet of paper with a radius 20 cm, four circles of radius 5 cm each are cut out. What is the ratio of the uncut to the cut portion?
a. 1 : 3 b. 4 : 1 c. 3 : 1 d. 4 : 3

4. The cost of diamond varies directly as the square of its weight. Once, this diamond broke into four pieces with weights in the ratio 1 : 2 : 3 : 4. When the pieces were sold, the merchant got Rs. 70,000 less. Find the original price of the diamond.
a. Rs. 1.4 lakh b. Rs. 2 lakh
c. Rs. 1 lakh d. Rs. 2.1 lakh

5. The question is followed by two statements, I and II. Mark the answer as.
a. if the question can be answered with the help of statement I alone.
b. if the question can be answered with the help of statement II, alone.
c. if both statement I and statement II are needed to answer the question.
d. if the question cannot be answered even with the help of both the statements.

If x, y and z are real numbers, is z – x even or odd?
I. xyz is odd.
II. xy + yz + zx is even.

Answer the questions based on following data.
The pages of a book are numbered 0, 1, 2 … upto M, M>0. There are four categories of instructions that direct a person in positioning the book at a page. The instruction types and their meanings are :
1. NEW : Position the book at page No. 1
2. END : Position the book at page No. 0
3. ONWARD, n :From the current page move forward by n pages; if, in this process, page number M is reached, stop at M.
4. REGRESS, n : From the current page, move backward by n pages; if in this process, page number 0 is reached, stop at page number 0.
In each of the following questions, you will find a sequence of instructions formed from the above categories. In each case, let n1 be the page number before the instructions are executed and n2 be the page number at which the book is positioned after the instructions are executed.

6. ONWARD, 25 ; REGRESS, 10. which of the following statements is true?
(a) n1=n2 if M=10 and n1=0
(b) M=20 provided n1>0
(c) n1>30 provided M=900
(d) n1=37 provided M=25

7. REGRESS, 5; ONWARD, 5. Which of the following statements is true about the above set of instructions?
(a) n1=n2 provided n1 ≥ 5

(b) n1=n2 provided n1>0
(c) n2=5 provided M>0
(d) n1>n2 provided M>0

8. ONWARD, 10; ONWARD, 10. Which of the following statements about the above instructions is true?
(a) n2-n1=20 only if n1=0
(b) n2-n1=20 if M>20 and n1=1
(c) n2-n1=10 if M=21 and n1=0
(d) n2>n1 if M>0

9. ONWARD, 5; REGRESS, 4. Which of the following statements about the above instructions is true?
(a) n2=n1+4 Provided 1<n1<7
(b) n2=n1 provided M<6
(c) n2=n1+1 provided M-n1>5
(d) n2-n1< 0 provided M>0

10. A circle is inscribed in a given square and another circle is circumscribed about the square. What is the ratio of the area of the inscribed circle to that of the circumscribed circle?
(a) 2 : 3
(b) 3 : 4
(c) 1 : 4
(d) 1 : 2

11. If y = f(x) and f(x) = (1-x) / (1 + x), which of the following is true?
(a) f(2x) = f(x) – 1
(b) x = f(2y)-1
(c) f(1/x) = f(x)
(d) x = f(y)

Directions for questions: Answer the questions on the basis of the information given below.
The HR Manager of the IT company recently scanned employees training results of various exams into the central computer system. When their character reading software cannot read something, it leaves the space blank. The scanner output reads as follows:

Name	Java	C Language	Testing	Analysis	Project Management	GPA
Amanpreet		B	F			1.4
Bikas	D	D	F	F		
Chandra		D	A	F	F	2.4
Deepak	A	B		D	D	3.2
Fazal	D	F	B		D	2.4
Gowri	C	C	A		B	3.8
Hari		B	A		D	2.8
Ismet			B		A	
Jagdeep	A	A	B		C	3.8
Kunal	F		A	F	F	1.8
Leena	B	A		B	F	3.2
Manab			A	B	B	
Navdeep	A	D	B	A	F	3.6

Osman	C		B	B	A	4.6
Preeti	F	D		D		3.2
Rahul	A	C	A		F	4.2
Sameer		C	F	B		
Tara	B					2.4
Utkarsh			F	C	A	3
Vipul	A		C	C	F	2.4

In the grading system, A, B, C, D, and F grades fetch 6, 4, 3, 2, and 0 grade points respectively. The Grade Point Average (GPA) is the arithmetic mean of the grade points obtained in the five subjects. For example Navdeep's GPA is (6 + 2 + 4 + 6 + 0) / 5 = 3.6. Some additional facts are also known about the students' grades. These are
(a) Vipul obtained the same grade in C Language as Amanpreet obtained in Java and Analysis.
(b) Fazal obtained the same grade in Analysis as Utkarsh did in C Language.
(c) Tara received the same grade in exactly three courses.

12. What grade did Preeti obtain in Testing?
(1) A (2) B (3) C (4) D

13. In Project Management, Tara could have received the same grade as
(1) Ismet (2) Hari (3) Jagdeep (4) Manab

14. In Analysis, Gowri's grade point was higher than that obtained by
(1) Fazal (2) Hari (3) Navdeep (4) Rahul

15. What grade did Utkarsh obtain in Java?
(1) B (2) C (3) D (4) F

Answer the questions based on following data.
A dealer deals only in colour TVs and VCRs. He wants to spend up to Rs.12 lakhs to buy 100 pieces. He can purchase a colour TV at Rs.10,000 and a VCR at Rs.15,000. He can sell a colour TV at Rs.12,000 and a VCR at Rs.17,500. His objective is to maximize profits. Assume that he can sell all the items that he stocks.

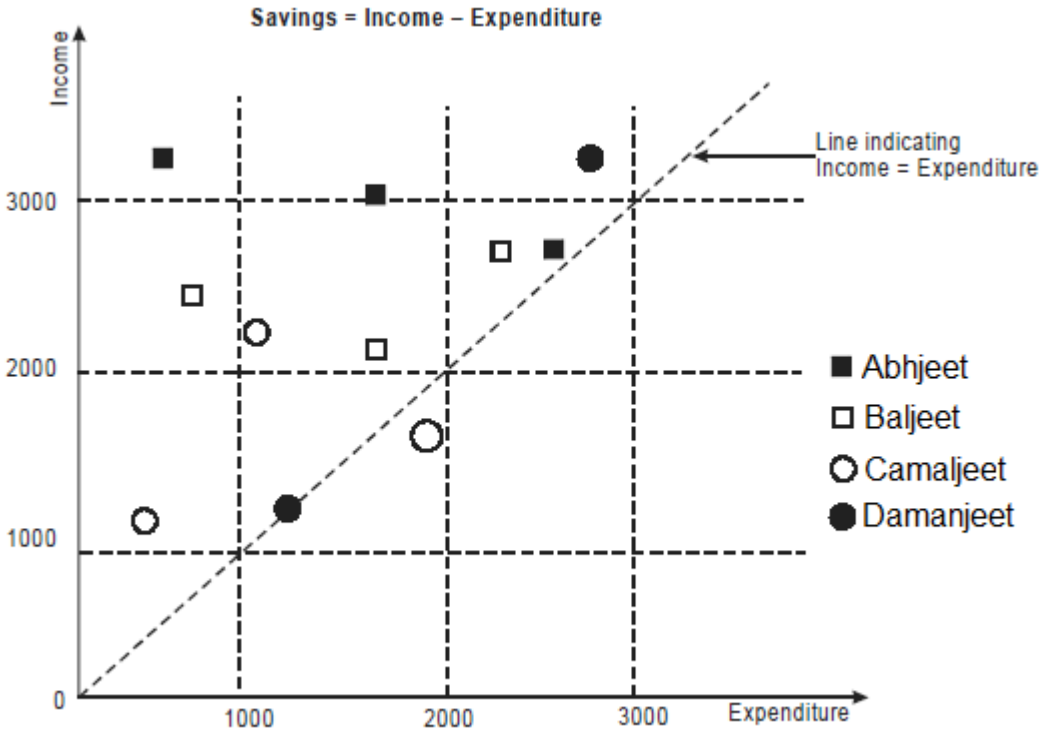
16. For the maximum profit, the number of colour TVs and VCRs that he should respectively stock are
(a) 80, 20
(b) 20, 80
(c) 60, 40
(d) None of these

17. If the dealer would have managed to get an additional space to stock 20 more items, then for maximizing profit, the ratio of number of VCRs and number of TVs that he should stock is
(a) 7 : 3
(b) 0
(c) 1 : 2
(d) None of these

18. The maximum profit, in rupees lakh, the dealer can earn from his original stock if he can sell a colour TV at Rs. 12200 and VCR at Rs.18300 is
(a) 2.64
(b) 2.49
(c) 2.72
(d) 2.87

CAT 2014 based paper

Directions for questions: Answer the questions on the basis of the information given below.
The data points in the figure below represent monthly income and expenditure data of individual members following families. For these questions, savings is defined as
Savings = Income – Expenditure



19. Which family has the lowest average income?
(1) Abhijeet (2) Baljeet (3) Camaljeet (4) Damanjeet

20. Which family has the highest average expenditure?
(1) Abhijeet (2) Baljeet (3) Camaljeet (4) Damanjeet

21. Which family has the lowest average savings?
(1) Abhijeet (2) Baljeet (3) Camaljeet (4) Damanjeet

22. The highest amount of savings accrues to a member of which family?
(1) Abhijeet (2) Baljeet (3) Camaljeet (4) Damanjeet

23. In a Tennis Open tournament 71 persons have signed up for elimination rounds. All players are to be paired up for the first round, but because 71 is an odd number one player gets a bye, which promotes him to the second round, without actually playing in the first round. The pairing continues on the next round, with a bye to any player left over. If the schedule is planned so that a minimum number of matches are required to determine the champion, the number of matches which must be played is
(a) 71
(b) 70
(c) 69
(d) 36

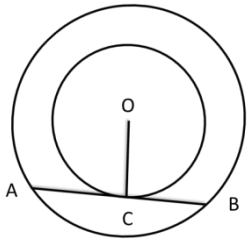
24. There are ten 50 paise coins placed on a table. Six of these show tails four show heads. A coin is chosen at random and flipped over (not tossed). This operation is performed seven times. One of the coins is then covered. Of the remaining nine coins, five show tails and four show heads. The covered coin shows
(a) a head

(b) a tail
(c) more likely a head
(d) more likely a tail

25. From each of the two given numbers, half the smaller number is subtracted. Of the resulting numbers the larger one is three times as large as the smaller. What is the ratio of the two numbers?
(a) 2 : 1
(b) 3 : 1
(c) 3 : 2
(d) None

26. Three identical cones with base radius r are placed on their bases so that each is touching the other two. The radius of the circle drawn through their vertices is
(a) smaller than r.
(b) equal to r.
(c) larger than r.
(d) depends on the height of the cones.

27. The line AB is 6 metres in length and is tangent to the inner one of the two concentric circles at point C. It is known that the radii of the two circles are integers. The radius of the outer circle is
(a) 5 metres
(b) 4 metres
(c) 6 metres
(d) 3 metres



Directions for Questions: Answer the following questions based on the information given below:
The following table shows the break-up of actual costs incurred by a company in last five years (year 2012 to year 2016) to produce a particular product:

	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016
Volume of production and sale (units)	1000	900	1100	1200	1200
Costs (Rs.)					
Input Material	50,000	45,100	55,200	59,900	60,000
Manpower	20,000	18,000	22,100	24,150	24,000
Variables	2,000	2,200	1,800	1,600	1,400
Rent	1,000	1,000	1,100	1,100	1,200
Taxes	400	400	400	400	400
Maintenance	800	820	780	790	800
Operational Cost	30,000	27,000	33,500	36,020	36,000
Marketing	5,750	5,800	5,800	5,750	5,800

The production capacity of the company is 2000 units. The selling price for the year 2016 was Rs. 125 per unit. Some costs change almost in direct proportion to the change in volume of production, while others do not follow any obvious pattern of change with respect to the volume of production and hence are considered fixed. Using the information provided for the year 2016 as the basis for projecting the figures for the year 2017, answer the following questions:

28. What is the approximate cost per unit in rupees, if the company produces and sells 1400 units in the year 2017?
(1) 104 (2) 107 (3) 110 (4) 115

29. What is the minimum number of units that the company needs to produce and sell to avoid any loss?
(1) 313 (2) 350 (3) 384 (4) 747

30. If the company reduces the price by 5%, it can produce and sell as many units as it desires. How many units the company should produce to maximize its profit?
(1) 1400 (2) 1600 (3) 1800 (4) 2000

31. Given that the company cannot sell more than 1700 units, and it will have to reduce the price by Rs.5 for all units, if it wants to sell more than 1400 units, what is the maximum profit, in rupees, that the company can earn?
(1) 25,400 (2) 24,400 (3) 31,400 (4) 32,900

Use the following information for next two questions:
A function f(x) is said to be even if f(-x)=f(x), and odd if f(-x) = -f(x). Thus, for example, the function given by $f(x) = x^2$ is even, while the function given by $f(x) = x^3$ is odd. Using this definition, answer the following questions.

32. The function given by $f(x) = |x|^3$
(a) even
(b) odd
(c) neither
(d) both

33. The sum of two odd functions
(a) is always an even function
(b) is always an odd function
(c) is sometimes odd and sometimes even
(d) may be neither odd nor even

34. A five digit number is formed using digits 1, 3, 5, 7 and 9 without repeating any one of them. What is the sum of all such possible numbers?
(a) 6666600
(b) 6666660
(c) 6666666
(d) None

35. A box contains 6 red balls, 7 green balls and 5 blue balls. Each ball is of a different size. The probability that the red ball selected is the smallest red ball, is
(a) 1/18
(b) 1/3
(c) 1/6
(d) 2/3

36. ABC forms an equilateral triangle in which B is 2 km from A. A person starts walking from B in a direction parallel to AC and stops when he reaches a point D directly east of C. He, then, reverses direction and walks till he reaches a point E directly south of C. Then D is
(a) 3 km east and 1 km north of A
(b) 3 km east and 3 km north of A
(c) 3 km east and 1 km south of A
(d) 3 km west and 3 km north of A

37. A lead cuboid of 8 inches in length, 11 inches in breadth, and 2 inches thick was melted and resolidified into the form of a rod of 8 inches diameter. The length of such a rod, in inches, is nearest to
(a) 3
(b) 3.5
(c) 4

(d) 4.5

Directions for Questions: Answer the following questions based on the information from an airline about their passengers (pax) in particular sectors is given below:
The proportion of males and the proportion of vegetarian pax are given below. The airline has a total of 800 passengers, 80% of whom are in the Mumbai - Delhi sector and rest are equally divided between Mumbai - Hyderabad and Mumbai - Bangalore.

Sector	Male (M)	Vegetarian (V)
Mumbai - Bangalore	0.6	
Mumbai - Hyderabad	0.55	0.5
Mumbai - Delhi sector		0.55
Total	0.475	0.53

38. What is the percentage of male pax in the Mumbai - Delhi sector?
(1) 40 (2) 45 (3) 50 (4) 60

39. In Mumbai - Bangalore, twenty five per cent of the vegetarians are male. What is the difference between the number of female vegetarians and male non-vegetarians?
(1) less than 8 (2) 10 (3) 12 (4) 16

40. What is the percentage of vegetarian pax in Mumbai - Bangalore?
(1) 40 (2) 45 (3) 50 (4) 60

41. In the Mumbai - Delhi sector, 50% of the pax are vegetarian males. Which of the following statements is correct?
(1) Except vegetarian males, all other groups have same number of pax.
(2) Except non-vegetarian males, all other groups have same number of pax.
(3) Except vegetarian females, all other groups have same number of pax.
(4) None of these.

Use the following information:
Eighty five people went to a lottery shop where they could bet on the DhanLaksmi, Rajshri, and Gauri lotteries. It was known that 20 of them took all three ets, and 55 of them took at least two of the three bets. Each bet cost Re. 1, and the total receipt of the lottery shop was Rs. 145.

42. How many people did not try any of the bets?
(a) 5
(b) 10
(c) 15
(d) 20

43. How many people took exactly one bet?
(a) 5
(b) 10
(c) 15
(d) 20

44. John bought five toffees and ten chocolates together for forty rupees. Subsequently, he returned one toffee and got two chocolates in exchange. The price of an chocolate would be
(a) 1
(b) 2
(c) 3
(d) 4

45. Let $a_{n+1} = 2\ a_n + 1$ ($_n = 0,1,2,....$) and $a_0 = 0$. Then u_{10} nearest to

(a) 1023
(b) 2047
(c) 4095
(d) 8195

46. Suppose you have a currency, named Rubble, in three denominations: 1 Rubble, 10 Rubbles and 50 Rubbles. In how many ways can you pay a bill of 95 Rubbles?
(1) 15 (2) 16 (3) 18 (4) 19

47. Consider four-digit numbers for which the first two digits are equal and the last two digits are also equal. How many such numbers are perfect squares?
(1) 3 (2) 2 (3) 4 (4) 1

48. The price of Coffee (in rupees per kilogram) is 100 + 0.10n, on the nth day of 2007 (n = 1, 2, ..., 100), and then remains constant. On the other hand, the price of Ooty tea (in rupees per kilogram) is 89 + 0.15n, on the nth day of 2007 (n = 1, 2, ..., 365). On which date in 2007 will the prices of coffee and tea be equal?
(1) May 21 (2) April 11 (3) May 20 (4) April 10

49. Two circles with centres P and Q cut each other at two distinct points A and B. The circles have the same radii and neither P nor Q falls within the intersection of the circles. What is the smallest range that includes all possible values of the angle AQP in degrees?
(1) Between 0 and 90 (2) Between 0 and 30 (3) Between 0 and 60 (4) Between 0 and 75

50. A quadratic function $f(x)$ attains a maximum of 3 at x = 1. The value of the function at x = 0 is 1. What is the value $f(x)$ at x = 10?
(1) –119 (2) –159 (3) –110 (4) –180

CAT 2014 based paper

22/34 questions in CAT 2014 could be solved using Catking Shortcuts

1. a Triange BCE is an equilateral triangle, and ABCD is a square, BC = CD. Hence, CD = CE. So in Triange CDE, we have CD = CE. Hence, ∠EDC =∠CED. Now∠BCE = 60° (since equilateral triangle) and∠BCD = 90° (since square). Hence,□∠DCE =∠DCB +∠BCE = (60 + 90) = 150°.So in ΔDCE, ∠EDC +∠CED = 30° (since three angles of a triangle add up to 180°). Hence, we have∠DEC =∠EDC = 15°.□

2. a Lets say if Shopkeeper buys 120m and pays only 100m Same while selling he sells 80m instead of 100 m. So using Cetking 1.2/0.8 shortcut for faulty gain… Gain = error margin / Paid quantity. Ie Gain = 40/80 = 50% ot 1.5times. So profit is 50%.

3. C the ratio of small circle to bigger circle is 1:4 . Using Cetking Similar Circles shortcuts
Therefore the ratio of area of small circle to big circle is 1:16.
Total 4 small circles are (cut area) to big circles area (uncut) ratio is 4:16 = 1:4
Therefore the uncut to cut will be 3:1

4. Let the original weight of the diamond be 10. Hence, its original price will be 100
The weights of the pieces after breaking are x, 2x, 3x and 4x. ie 1:2:3:4
Therefore, their prices will be (1 + 4 + 9 + 16) = 30. Using Cetking Arithmetic shortcuts
Hence, the difference in the price of the original diamond and its pieces = 70 and its value is 70000.
Hence, the original price (100) will be 100,000/-

5. Statement I - xyz is odd, Means that all three of them are odd. Hence, z – x is even.
Statement II - xy + yz + zx is even,
So only statement I is required to answer the question.

6. a ONWARD 25, REGRESS 10 would effectively mean a ONWARD 15 i.e. n2-n1 = 15, (if M – n1> 25) and n2 = M – 10 (if M – n1 < 25). The only option that satisfies this is option (a). So if M = 10 and n1 = 0., then M – n1 < 25 and so n2 = 10 – 10 = 0. Hence, n1=n2

7. a REGRESS, 5; ONWARD, 5 would effectively mean n1 = n2 (in case n1 ≥ 5) or n2 = 5 (in case n1<5). The only option that satisfies this is (a).

8. b ONWARD, 10 ; ONWARD, 10 would effectively mean a ONWARD 20 i.e. n2-n1 = 20, (if M – n1 ≥ 20) .or n2 = M (if M – n1 < 20). The option that satisfies this condition is (b), as if M>20 and n1=1, then M – n1 > 20, and hence n2-n1 = 20.

9. c ONWARD, 5; REGRESS, 4, would effectively mean a ONWARD 1 i.e. n2-n1 = 1 (if M – n1 ≥ 5) or n2 = M – 4 (if M – n1< 5). The option that satisfies this condition is (c).

10. Let C1 be inscribed circle, S be the square with side a and C2 be the circumscribed circle.
the diameter of the C1 = Side of the square S ie a.
diameter of the C2 = Diagonal of the S ie √2a
Ratio of diameter of C1 : C2 = a : √2a = 1: √2
Using cetking similar circle shortcuts
Area C1 : Area C2 = Square of diameter of C1 : C2 = Squre of 1: √2 = 1:2

11. Use Cetking dirty quant shortcut to solve this question.
Let x = 2. Hence f(2) = (1 – 2)/(1 + 2) = -1/3 = y.
Using Elimination method only option (d) satisfies the condition.
f(y) = (-1/3) = (1 + 1/3)/(1 – 1/3) = 2 = x.

12. 1 GPA of Preeti = 3.2
i.e. F + D + X + D + Y / 5 = 3.2
0 + 2 + x + 2 + y = 16
x + y = 12
So only combination possible is A, A.
So Preeti obtained A grade in testing.

13. 4 Tara received same grade in 3 courses. We already know that Tara has got B grade in one of the subject and GPA is 2.4. So in 3 courses in which he scored same grade is B.
So Tara has received the same grade as Manab.

14. 2 GPA of Gowri is 3.8
i.e. 3 + 3 + 6 + x + 4 = 3.8 × 5
16 + x = 18
x = 2
So in Analysis, Gowri's grade is C.
Rahul's grade in Analysis = (4.2 × 5) – 15 = 6, i.e., A.
Fazal's grade in Analysis = (2.4 × 5) – 8 = 4, i.e., B.
Hence, Gowri's grade will be higher than that of Hari.

15. 3 As Fazal GPA = 2.4
So D + F + B + P + D = 2.4 × 5
2 + 0 + 4 + P + 2 = 12
P = 4
So his grade in Analysis is B.
So Grade of Utkarsh in C Language is also B.
So for Utkarsh, x + B + F + C + A = 3 × 5
x + 4 + 0 + 3 + 6 = 15
x = 2
So grade of Utkarsh in Java = D.

16. We can use Mixtures shortcut method to solve these questions. average cost per piece = 1200000/100 = Rs.12000

```
10000   15000
    \     /
     12000
   /       \
3000       2000 . hence he should stock 60TV and 40 VCRs.
```

17. We can use Mixtures shortcut method to solve these questions. the average cost per piece would now be 1200000/120 = Rs.10000. (20 more items are stocked)

```
10000   15000
    \     /
     10000
   /       \
5000       0 . hence the ratio VCR's and TV's is 0.
```

18. We can use Mixtures shortcut method to solve these questions.
The stock should be 60 TV's and 40 VCR's for Max profit.
profit made per TC = 12200 – 10000 = Rs.2200
Profit made per VCR = 18300 – 15000 = 3300.
Therefore the total profit will be (2200 x 60) + (3300 x 40) = 264000 = 2.64 lakhs.

19. 3 Average income of Abhjeet = (700 + 1700 + 1800) / 3 = 4200 / 3
Average income of Baljeet = (800 + 1600 + 2300) / 3 = 4700 / 3
Average income of Camaljeet= (300 + 1100 + 1900) / 3 = 3300 / 3
Average income of Damanjeet = (1200 + 2800) / 2 = 4000 / /2
It's clear that lowest average income is of Camaljeet. (It is clear visually as well)

20. 4 From the figure draw a line parallel to the expenditure axis and midway between observations of each family's values.

21. 4 From figure the Ist member of Damanjeet family is on the line indicating income = expenditure. The 2nd member is just above the line.

22. 1 Look at the leftmost member of Abhjeet family.

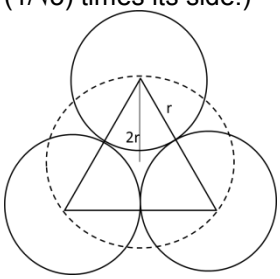
23. 1 For every 20 players there will be 10 matches. So round 1 will have 70 players one getting bye. So 35 matches. Shortcut: Using Logical approach – for every match there will be one 1 person loosing out. So to get one winner total 70 people have to loose ie 70 matches.

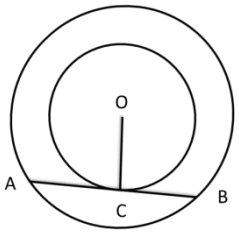
Round 1	35
Round 2	18
Round 3	9
Round 4	5
Round 5	2
Round 6	1
Total	70

24. 1 after 7 rounds there are two cases: Number of Tails is 6 and number of Heads is 4. Number of Tails is 5 and number of Heads is 5. Now, when the operation is performed seven times i.e. odd number of times, the number of Tails and Heads could be (1, 9), (3, 7), (5, 5), (7, 3) and (9, 1). Thus, the only possible case is number of Tails is 5 and number of Heads is 5. Therefore the covered coin shows Head.

25. 1 for $x < y$, $y – x/2 = 3(x – x/2)$. Therefore $x/y = 2/1$.

26. 3. 3 cones touching each other means placing 3 circles touching. Centers of the circle forms an equilateral triangle with each side = 2r. Circle that passes through the centers will be the circumcircle to such a triangle. Ie $(2r/\sqrt{3})$ ie $(2r/\sqrt{3}) > r$. (The radius of the circumcircle of an equilateral triangle is $(1/\sqrt{3})$ times its side.)





27. 1.AC = AB = 3 m (Perpendicular from the centre bisects). So if the radii of the inner and outer circles are r1 and r2 respectively, then since OCB is a right angled triangle, $r1^2 + 3^2 = r2^2$. Cetking Geometry shortcut – Triplets: If one side is 3 cm other two sides will be 4 and 5. as only triplet with 3 in it is 3-4-5. Hence r2 = 5.

Looking at the values in the table one can easily conclude that the costs which are directly proportional to the change in volume of proportion are ‘Input Material’, ‘Manpower’ and ‘Operating cost of machines’. Rest of the costs are all fixed costs. If ‘x’ is the number of units produced in 2017 then the total cost of production would be
C = 9600 (Fixed cost) + 100x (Variable cost)
Variable cost = 100x because as the number of units for 2016 is 1200 and variable cost for that is 120000 i.e. 100 times the number of units.

28. 2 Total cost = 9600 + 100 × 1400 = 149600
Cost per unit = 149600 / 1400 = 107 approx

29. 3 To avoid any loss the total selling price should be equal to the total cost price. If ‘x’ units are produced and selling price of each unit is 125 Rs.
Therefore, 125x = 9600 + 100x
25x = 9600
⇒ x = 384

Hence, 384 units should be produced.

30. 4 profit would be maximum if the number of units are maximum i.e. 2000

31. 1 If the company sells a maximum of 1400 units, the selling price is fixed at Rs. 125 per unit. If more than 1400 units are sold, the selling price is reduced to Rs. 120 per unit. The company cannot sell more than 1700 units.
To earn maximum profit at a unit selling price of Rs. 125, the company must sell 1400 units. The maximum profit earned, denoted by P0, is calculated as below:
Profit = (Selling Price) – (Cost Price)
P0 = 125 × 1400 – (9600 + 100 × 1400) = Rs. 25400
Now if the company sells an x number of units
(x > 1400) then the profit earned will be:
Px = 120 × x – (9600 + 100 × x) = 20 × x – 9600
The minimum value of x for which Px will be more than
P0 must satisfy the following inequality:
20 × x – 9600 > 25400
⇒ x > 1750
As only a maximum of 1700 units can be sold, Px will never be more than P0. Hence the maximum profit that can be earned is Rs. 25400 only.
Hence (1) is correct.

Functions and Graphs.
This is the problem with functions and graphs. It's one of the easiest topics in CAT but students get scared of it and leave it. Following both questions were cake walk even if you have bare minimum knowledge of functions.

32. 1. $f(x) = |x|^3$ The function is even as $f(-x) = |-x|^3 = |x|^3 = f(x)$.

33. 2 sum of two odd functions
Let f(x) = a(x) + b(x) where g and h are odd functions.
f(-x) = a(-x) + b(-x) = –a(x)–b(x) = - {a(x) + b(x) } = –f(x). So f(x) is odd.

34. 1 Fix one digit, then the remaining four digits can be arranged in 4! = 24 ways.
Sum of the digits will be 24(1+3+5+7+9) = 600
Sum of all such numbers at their positions will be 600(1 + 10 + 100 + 1000 + 10000) = 6666600

35. 3 Typical CAT question.. This question is very easy but tricky.
Question 1: The probability that the ball selected is the smallest red ball = 1/18
Question 2: The probability that the red ball selected is the smallest red ball = 1/6
Here we are talking about question 2 so answer is 1/6.

36. 2 Since triangle ABC is an equilateral triangle with side 2 km, its altitude will be 3 km. Hence D is 3 km. to the north of A.

37. 2 volume remains constant, we can say Volume cuboid = Volume cylinder
Ie (8 x 11 x 2) = L x∏ x 4^2 => L = 3.5 inches.

Sector	M	F	V	NV	Total
Mumbai - Bangalore	48	32	32	48	80
Mumbai - Hyderabad	44	36	40	40	80
Mumbai - Delhi sector	288	352	352	288	640
Total	380	420	424	376	800

38. 2. Percentage of male pax in the Mumbai - Delhi sector. = 288/640 x 100 = 45%

39. 4.
Male vegetarians = 8; Female vegetarians = 24; So, their difference is 16.

40. 1 Percentage of vegetarian pax in Mumbai - Bangalore = 32 / 80 x 100 = 40%

41. 4. According to the table none of the above is true.

Solution to next questions:
Since 20 of them took all three and 55 of them took at least two of the three bets, we can say that (55 – 20) = 35 of them took exactly two bets. Also the number of rides taken in all = 145. Now, we know that x + y + z = T and x + 2y + 3z = RT, where
x = number of members belonging to exactly 1 set
y = number of members belonging to exactly 2 sets = 35
z = number of members belonging to exactly 3 sets = 20
T = Total number of members who belong to at least one of the 3 sets
RT = Repeated total of all the members = 145
Thus we have two equations and two unknowns. Solving this we get x = 15 and T = 70. Hence, 15 of them took only 1 bet and 70 of them took at least 1 of the 3 bets. This means that (85 – 70) = 15 of them did not take any bet.
42. 3
43. 3

44. 2; 1 toffee = 2 chocolates. Hence 5 toffee will be equivalent to 10 chocolates. So 20 chocolates cost Rs.40, or one chocolate will cost Rs.2. This was easiest question in the last 10 years of CAT papers. (2005- 2014)

45. 1
$a_0 = 2^0 - 1 = 0$
$a_1 = 2^1 - 1 = 1$
$a_2 = 2^2 - 1 = 3$
$a_3 = 2^3 - 1 = 7$ and so on.
Therefore $a_{10} = 2^{10} - 1 = 1023$.

46. 1 Total are 15 combinations as shown below:

Combination	50 Rubbles	10 Rubbles	1 Rubble	Total
1	0	0	95	95
2	0	1	85	95
3	0	2	75	95
4	0	3	65	95
5	0	4	55	95
6	0	5	45	95
7	0	6	35	95
8	0	7	25	95
9	0	8	15	95
10	0	9	5	95
11	1	0	45	95
12	1	1	35	95
13	1	2	25	95
14	1	3	15	95
15	1	4	5	95

47. 4 Let the four-digit number be denoted by aabb = 11 × (100a + b).
Now since aabb is a perfect square 100a + b should be a multiple of 11.
The only pairs of values of a and b that satisfy the above mentioned condition is a = 7 and b = 4. Now

7744 is a perfect square.

48. 3 Price of Coffee (in rupees per kilo gram) is 100 + 0.10n
Price of Ooty tea (in rupees per kilo gram) is 89 + 0.15n
Price of the Coffee on the 100th day = 100 + 0.1 × 100 = 110 => 89 + 0.15n = 110 => n = 140.
Number of days in the months of January, February, March and April in the year 2007 = 31 + 28 + 31 + 30 = 120. Therefore the price of both the tea and coffee will be equal on 20th May.

49. 3 If P and Q lie on the intersections of the circles minimum angle is zero.
In this case it form a equilateral triangle APQ its 60 degrees. So the maximum possible measure of the angle AQP is 60°. The answer is between 0 and 60.

50. 2 Let $f(x) = mx^2 + bx + c$
At x = 1, f(1) = m + b + c = 3
At x = 0, f(0) = c = 1
The maximum of the function f(x) is attained at
x = -b/2m = 1 = (m – 2) / 2m
=> m = –2 and b = 4
Therefore $f(x) = –2x^2 + 4x + 1$
Therefore f(10) = –159

CAT 2014 based paper

CAT 2014 based paper

Answer the questions below on the basis of the following passage.

More selective than most chemical pesticides in that they ordinarily destroy only unwanted species, biocontrol. agents (such as insects, fungi, and viruses) eat, infect, or parasitize targeted plant or animal pests. However, biocontrol agents can negatively affect nontarget species by, for example, competing with them for resources: a biocontrol agent might reduce the benefits conferred by a desirable animal species by consuming a plant on which the animal prefers to lay its eggs.

Another example of indirect negative consequcnces occurred in England when a virus introduced to control rabbits reduced the amount of open ground (because large rabbit populations reduce the ground cover), in turn reducing underground ant nests and triggering the extinction of a blue butterfly that had depended on the nests to shelter its offspring. The paucity of known extinctions or disruptions resulting from indirect interactions may reflect not the infrequency of such mishaps but rather the failure to look for or to detect them: most organisms likely to be adversely affected by indirect interactions are of little or no known commercial value and the events linking a biocontrol agent with an adverse effect are often unclear. Moreover, determining the potential risks of biocontrol agents before they are used is difficult, especially when a nonnative agent is introduced, because, unlike a chemical pesticide, a biocontrol agent may adapt in unpredictable ways. so that it can feed on or otherwise harm new hosts.

1. The passage is primarily concerned with

A. explaining why until recently scientists failed to recognize the risks presented by biocontrol agents.
B. emphasizing that biocontrol agents and chemical pesticides have more similarties than differences.
C. suggesting that only certain biocontrol agents should be used to control plant or animal pasts.
D. arguing that biocontrol agents involve risks, some of which may not be readily discerned.

2. The passage suggests that the author would be most likely to agree with which of the following statements about the use of biocontrol agents?

A. Biocontrol agent should be used only in cases where chemical pesticides have proven ineffective or overly dangerous.
B. Extinctions and disruptions resulting from the use of biocontrol agents are likely to have increasingly severe commercial consequences.
C. The use of biocontrol agents does not require regulation as stringent as that required by the use of chemical pesticides.
D. The risks of using native biocontrol agents may be easier to predict than the risks of using nonnative biocontrol agents.

3. Which of the following is mentioned in the passage as an indirect effect of using a biocontrol agent?

A. Reduction of the commercial value of a desirable animal species
B. An unintended proliferation of a nontarget animal species
C. An unforeseen mutation in a target species
D. Diminution of the positive effects conferred by a nontarget animal species.

4. The example presented by the author in highlight text most clearly serves to illustrate

A. a situation in which a species is less vulnerable to biocontrol agents than it would have been to chemical pesticides.
B. a way in which the introduction of a biocontrol agent can affect a nontarget species.
C. a nonnative agent's adapting in an unpredictable way that results in damage to a new host.
D. The contention that biocontrol agents can harm nontarget species by competing with them for resources

5. Arrange sentences A, B, C and D between sentences 1 and 6 to form a logical sequence of six sentences.

1. Buddhism is a way to salvation.
A. But Buddhism is more severely analytical.
B. In the Christian tradition there is also a concern for the fate of human society conceived as a whole, rather than merely as a sum or network of individuals.
C. Salvation is a property, or achievement of individuals.
D. Not only does it dissolve society into individuals, the individual in turn is dissolved into component parts and instants, a stream of events.
6. In modern terminology, Buddhist doctrine is reductionist.
a. ABDC b. CBAD c. BDAC d. ABCD

6. Arrange sentences A, B, C and D between sentences 1 and 6 to form a logical sequence of six sentences.

1. The problem of improving Indian agriculture is both a sociological and an administrative one.
A. It also appears that there is a direct relationship between the size of a state and development.
B. The issues of Indian development, and the problem of India's agricultural sector, will remain with us long into the next century.
C. Without improving Indian agriculture, no liberalisation and delicensing will be able to help India.
D. At the end of the day, there has to be a ferment and movement of life and action in the vast segment of rural India.
6. When it starts marching, India will fly.
a. DABC b. CDBA c. ACDB d. ABCD

Hidden Island is an obscure island which is inhabited by two types of people: the 'Yes' type and the 'No' type. Native of type 'Yes' ask only questions the right answer to which is 'Yes' while those of type 'No' ask only questions the right answer to which is 'No'. For example. The 'Yes' type will ask questions like "Is 2 plus 2 equal to 4?" while the 'No' type will ask questions like "Is 2 plus 2 equal to five?" The following questions are based on your visit to the Hidden Island.

7. If an islander asks, "Do I belong to the 'No' type", which of the following is correct?
(a) He is a 'No'.
(b) He is a 'Yes'.
(c) It is impossible for him to have asked such a question.
(d) His type cannot be identified.

8. Aman and Mohan are brothers from the Island. Mohan asks you, "Is at least one of us brothers of type 'No"? You can
conclude that
(a) Aman is 'NO', Mohan is 'Yes '.
(b) both are 'Yes'.
(c) Aman is 'Yes', Mohan is 'No'.
(d) both are 'No'.

9. Arrange sentences A, B, C and D between sentences 1 and 6 to form a logical sequence of six sentences.

1. Good literary magazines have always been good because of their editors.
A. Furthermore, to edit by committee, as it were, would prevent any magazine from finding its own identity.
B. The more quirky and idiosyncratic they have been, the better the magazine is, at least as a general rule.

C. But the number of editors one can have for a magazine should also be determined by the number of contributions to it.
D. To have four editors for an issue that contains only seven contributions, it is a bit silly to start with.
6. However, in spite of this anomaly, the magazine does acquire merit in its attempt to give a comprehensive view of the Indian literary scene as it is today.
a. ABCD b. BCDA c. ABDC d. CBAD

Directions for Questions:
Answer the following questions based on the statements given below:
Following questions are about 6 project reports of different heights from 6 different students and of 6 different colors displayed on a cupboard.
(i) There are three Project Reports on each side of the aisle.
(ii) These six Project Reports are labeled as Piyush, Qadar, Richa, Sandesh, Tanvi and Urvashi.
(iii) The Project Reports are of different colours, namely, Red, Blue, Green, Orange, Yellow and White.
(iv) The Project Reports are of different heights.
(v) Tanvi, the tallest Project Report, is exactly opposite to the Red coloured Project Report.
(vi) The shortest Project Report is exactly opposite to the Green coloured Project Report.
(vii) Urvsahi, the Orange coloured Project Report, is located between Piyush and Sandesh.
(viii) Richa, the Yellow coloured Project Report, is exactly opposite to Piyush.
(ix) Qadar, the Green coloured Project Report, is exactly opposite to Urvashi.
(x) Piyush, the White coloured Project Report, is taller than Richa, but shorter than Sandesh and Qadar.

10. What is the colour of the Project Report diagonally opposite to the Yellow coloured Project Report?
(1) White (2) Blue (3) Green (4) Red (5) none of these

11. Which is the second tallest Project Report?
(1) Piyush (2) Sandesh (3) Qadar (4) Richa

12. What is the colour of the tallest Project Report?
(1) Red (2) Blue (3) Green (4) none of these

13. What is the color of the report named Richa?
(1) Red (2) Blue (3) Green (4) Yellow

14. In each of the following questions, a part of a sentence is left blank. Choose from among the four options given below each question, the one which would best fill the blanks.
When we call others dogmatic, what we really object to is ___.
a. their giving the dog a bad name
b. their holding beliefs that are different from our own
c. the extremism that goes along with it
d. the subversion of whatever they actually believe in concomitantly

15. Science, because people engage in it, is a socially embedded activity. It progresses by hunch, vision, and intuition. Much of its change through time does not record a closer approach to absolute truth, but the alternation of the cultural contexts that influence it so strongly. Facts are not pure and unsullied bits of information— culture influences what we see and how we see it. Theories, moreover, are not inexorable inductions from facts. The most creative theories are often imaginative visions imposed upon facts; the source of imagination is also strongly cultural.
The author implies that those who rely on scientific results should
a) realize that science relies on imagination to approach absolute truth
b) insist on pure and unsullied facts rather than on theories

c) understand that theories are frequently strict inductions from facts
d) consider the cultural biases of scientists

16. Baking for winter holidays is tradition that may have a sound medical basis. In midwinter, when days are short, many people suffer from a specific type of seasonal depression caused by lack of sunlight. Carbohydrates, both sugars and starches, boost the brain's levels of serotonin, a neurotransmitter that improve the mood. In this respect, carbohydrates act on the brain in the same way as some antidepressants. Thus, eating holiday cookies may provide an effective form of self-prescribed medication.

Which one of the following can be properly inferred from the passage?
(A) Seasonal depression is one of the most easily treated forms of depression.
(B) Lack of sunlight lowers the level of serotonin in the brain.
(C) People are more likely to be depressed in midwinter than at other times of the year.
(D) Some antidepressants act by changing the brain's level of serotonin.

CAT 2014 based paper

Answer the questions below on the basis of the following passage.

When views can freely flourish in the marketplace of ideas, individuals are afforded the advantage of deciding what notions and concepts to question, support or reject. On June 8, 1789, James Madison introduced in the House of Representatives an amendment to the Constitution: “The people shall not be deprived or abridged of their right to speak, to write, or to publish their sentiments; and the freedom of the press, as one of the great bulwarks of liberty, shall be inviolable.” This commitment to a free press is a principle Americans hold firmly, because they view it as a necessary ingredient for a properly functioning political process and a critical component of a free society. Yet, since the time of America’s founding, the politicized nature of the press has not fundamentally changed.

While conservatives and liberals alike claim that today’s mainstream media is biased, opinionated, and devoid of objectivity and balanced analysis, American newspapers at the time of this nation’s birth were all partisan, believing that their responsibility was not to report news, but to convey, without apology, a particular political position. Perhaps the high point of partisan newspapers was in New York during the 1920’s, when the city had over a dozen daily papers, each geared toward a particular ethnic and political niche; people selected the paper that made the most sense of the world to them. Despite the naysayers who warn that the lack of objectivity and fair-mindedness is corrosive to society, partisan journalism can be good journalism. It produces plenty of excellent reporting and analysis and is the norm in many nations. Two centuries ago, newspapers subsidized by Andrew Jackson's Democrats and Henry Clay's Whigs were dependable supporters of their parties. Today’s newspapers claim that they too are only giving their readership what it wants.

Legally, the Supreme Court has tried since 1919 to clarify how free the press is. Over time, older laws that allowed publications to be punished for libel, obscenity, sedition, and publishing inflammatory material have given way to more expansive rights to publish. The First Amendment protections offered to journalists have evolved to a broader interpretation of freedom of the press. During the 1960’s and 1970’s, journalists exposed the government’s mismanagement of the Vietnam War, and their investigative reporting eventually brought about the resignation of President Nixon. By the end of the twentieth century, the Constitution’s protections were broadly held to cover the content of all papers, from the highly regarded New York Times to tabloids such as The National Enquirer.

17. According to the author, which of the following is true about partisan journalism throughout American history?

a) It has had a limited impact on the political process.
b) Its lack of objectivity is detrimental.
c) It has played an important role in reliably informing individuals from diverse cultural backgrounds.
d) It has essentially been the status quo since America’s founding.

18. Which of the following statements about American newspapers is supported by information contained in the passage?

a) America’s newspapers in 1789 resembled those of today in form and content.
b) The character of the press has matured since the time of America’s founding.
c) In recent years, the press has become biased in regard to its political reporting.
d) Early American journalists did not necessarily provide a balanced analysis of events.

19. The author of the passage would disagree with which of the following statements?

a) The legal understanding of press freedoms has shifted over time.
b) Over time, the First Amendment protections offered to the press have become absolute.
c) America’s legal evolution has given way to a more liberal understanding of press freedom.
d) First Amendment press rights today protect a broad section of the newspaper industry.

20. All of the following are examples of limitations the courts have placed on freedom of the press, EXCEPT

a) articles deemed maliciously defamatory of individuals
b) articles viewed as offensive to society's views of decency
c) articles that comment negatively on a political affiliation
d) articles clearly dangerous to national security

21. Street crime can be averted through regulations mandating the lighting of streetlights during daytime. As daytime visibility is worse in nations farther from the equator, so obviously such regulations would be more successful in averting crime there. Actually, the only nations that have adopted such regulations are farther from the equator than the continental United States.
Which of the following conclusions could be most properly drawn from the information given above?

A. Bystanders in the continental United States who were near lit streetlights during the day would be just as likely to become victims of a crime as would bystanders who were not near lit streetlights.
B. Inadequate daytime visibility is the single most important factor in street crime in numerous nations that are located farther from the equator than is the continental United States.
C. In nations that have daytime streetlight regulations, the percentage of street crime that happens in the daytime is greater than in the continental United States.
D. Daytime streetlight regulations would probably do less to avert street crime in the continental United States than they do in the nations that have the regulations.

22. During the construction of the Quebec Bridge in 1907, the bridge's designer, Theodore Cooper, received word that the suspended span being built out from the bridge's cantilever was deflecting downward by a fraction of an inch (2.54 centimeters). Before he could telegraph to freeze the project, the whole cantilever arm broke off and plunged, along with seven dozen workers, into the St. Lawrence River. It was the worst bridge construction disaster in history. As a direct result of the inquiry that followed, the engineering "rules of thumb" by which thousands of bridges had been built around the world went down with the Quebec Bridge. Twentieth-century bridge engineers would thereafter depend on far more rigorous applications of mathematical analysis.

Which one of the following statements can be properly inferred from the passage?

A. Prior to 1907 the mathematical analysis incorporated in engineering rules of thumb was insufficient to completely assure the safety of bridges under construction.
B. Cooper's absence from the Quebec Bridge construction site resulted in the breaking off of the cantilever.
C. Nineteenth-century bridge engineers relied on their rules of thumb because analytical methods were inadequate to solve their design problems.
D. Only a more rigorous application of mathematical analysis to the design of the Quebec Bridge could have prevented its collapse.

23. Choose the option that best captures the essence of the passage.
There are many and good reasons why women have left little in the way of literary monuments, especially poetry. The main reason is education, or more specifically the lack of it in most women's lives until well into the twentieth century. In the light of this, what is surprising is not that so few women wrote poetry, but that any women wrote poetry at all. When a woman who had never been to grammar school, never learnt Latin and did not know the rules of syntax, let alone of prosody, set herself to writing lines that rhymed, she was imitating an art that, admire it though she might, she did not understand — a male art, a male tradition. This meant she generally produced poetry that was at best imperfect, at worst, frankly bad.

a) The reason why women haven't created literary monuments is because until recently they were not educated. In this case, the only option for an uneducated woman was to plagiarize in order to show herself as superior.
b) The lack of education is the biggest reason for women's lack of achievements in the literary sphere. In the absence of the knowledge of basics, she would see the male creations as 'ideal' and try to copy them.

c) The lack of education is the biggest reason for women's lack of achievements in the literary sphere. Feeling inferior to educated men, they would imitate them in every area including literature.
d) The lack of education is the biggest reason for women's lack of achievements in the literary sphere. It suited men well since in such a scenario the women had no choice but to imitate the men.

Recently, Rajesh visited the local casino where he came across a new card game. Two players, using a normal deck of 52 playing cards, play this game. One player is called the 'dealer' and the other is called the 'player'. First, the player picks a card at random from the deck. This is called the base card. The amount in rupees equal to the face value of the base card is called the base amount. The face values of ace, king, queen and jack are ten. For other cards the face value is the number on the card. Once the 'player' picks a card from the deck, the 'dealer' pays him the base amount. Then the 'dealer' picks a card from the deck and this card is called the top card. If the top card is of the same suit as the base card, the 'player' pays twice the base amount to the 'dealer'. If the top card is of the same colour as the base card (but not the same suit), then the 'player' pays the base amount to the 'dealer'. If the top card happens to be of a different colour than the base card, the 'dealer' pays the base amount to the 'player'.

Rajesh played the game four times. First time he picked eight of clubs and the 'dealer' picked queen of clubs. Second time, he picked ten of hearts and the 'dealer' picked two of spades. Next time, Rajesh picked six of diamonds and the 'dealer' picked ace of hearts. Lastly, he picked eight of spades and the 'dealer' picked jack of spades. Answer the following questions based on these four games.

24. If Rajesh stopped playing the game when his gain would be maximized, the gain in Rs. Would have been
a. 12 b. 20 c. 16 d. 4

25. The initial money Rajesh had (before the beginning of the game sessions) was Rs. X. At no point did he have to borrow any money. What is the minimum possible value of X?
a. 16 b. 8 c. 100 d. 24

26. If the final amount of money that Rajesh had with him was Rs. 100, what was the initial amount he had with him?
a. 120 b. 8 c. 4 d. 96

27. If Rajesh stopped playing the game when his loss would be maximumm, the loss in Rs. Would have been
a. -12 b. -20 c. -8 d. -4

Answer the questions below on the basis of the following passage.

The communities of ants are sometimes very large, numbering even up to 500, individuals: and it is a lesson to us that no one has ever yet seen quarrel between any two ants belonging to the same community. On the other hand, it must be admitted that they are in hostility not only with most other insects, including ants of different species, but even with those of the same species if belonging to different communities. I have over and over again introduced ants from one of my nests into another nest of the same species; and they were invariably attacked, seized by a leg or an antenna, and dragged out.

It is evident, therefore, that the ants of each community all recognize one another, which is very remarkable. But more than this, I several times divided a nest into two halves and found that even after separation of a year and nine months they recognize one another and were perfectly friendly, while they at once attacked ants from a different nest, although of the same species.

It has been suggested that the ant of each nest have some sign or password by which they recognize one another. To test this I made some of them insensible, first I tried chloroform; but this was fatal to them, and I did not consider the test satisfactory. I decided therefore to intoxicate them. This was less easy than I had expected. None of my ants would voluntarily degrade themselves by getting drunk. However, I got over the difficulty by putting them into whisky for a few moments. I took fifty specimens - - twenty five percent from one nest and twenty five percent from another made them dead drunk, market each with a spot of paint, and put them on a table close to where other ants from one the nests were feeding.

The table was surrounded as usual with a moat of water to prevent them from straying. The ants, which were feeding, soon noticed those, which I had made drunk. They seemed quite astonished to find their comrades in such a disgraceful condition, and as much at a loss to know what to do with their drunkards as we were. After a while, however, they carried them all away; the strangers they took to the edge of the moat and dropped into the water, while they bore their friends home into the nest, where by degrees they slept off the effects of the spirits. Thus it is evident that they know their friends even when incapable of giving any sign or password.

28. Attitudes of ants towards strangers of the same species may be categorized as
(a) indifferent
(b) curious
(c) hostile
(d) passive

29. The author's anecdotes of the inebriated ants would support all the following inductions except the statement that
(I) ants take unwillingly to intoxicants
(II) ants aid comrades in distress
(III) ants have invariable recognition of their community members
(IV) ants recognize their comrades by a mysterious password.
(a) I and II (b) I and III (c) Only III and IV (d) only IV.

30. According to the passage, chloroform was less successful than alcohol for inhibiting communication because of
(I) its expense
(II) its unpredictable side effects
(III) its unavailability
(IV) its fatality
(a) I and II (b) I and III (c) Only III and IV (d) only IV.

31. All of the following sentences A, B, C and D are taken from a same passage and jumbled up. but one of them is incoherent. Find the incoherent statement.

A. Reliance Industries (RIL), India's largest company, saw its earnings before interest and taxes jump 15 per cent from the first quarter to the second, though net profits grew at a far more modest 2.6 per cent.
B. Part of the reason for this was a sharp, 8 per cent-plus fall in its refining margins, down from $8.40 per barrel in Q1 to $7.70 per barrel in Q2.
C. For RIL, refining and selling oil and making petrochemicals are not new. Investors understand these businesses and value them realistically.
D. This fall happened because the Asian demand — and, therefore, pricing — of lighter fuels like diesel and petrol was under pressure, possibly because most major emerging economies are growing slower than they were before.

Incoherent statement is:
A. B. C. D.

32. All of the following sentences A, B, C and D are taken from a same passage and jumbled up. but one of them is incoherent. Find the incoherent statement.

Sachin did not ask for this honour.
A. There are consolation prizes which console, and some which char the soul.
B. I am not suggesting we write a condolence letter, but sympathy is certainly due to Sachin.
C. Membership of Parliament is a handsome freebie for Sachin Tendulkar
D. Nomination to the Rajya Sabha is a pretty desultory substitute for someone who has been promised the Bharat Ratna.
Delhi's politicians, ever eager to climb a bandwagon, led the clamour for Sachin's elevation to jewel of India after he got his 99th international hundred.

Incoherent statement is:
A. B. C. D.

33. Education Secretary: Too many adults lack sufficient skills for job advancement because of the cost of higher education. Businesses should partner with educators to create curricula that are tailored to the needs of these people, thus increasing the likelihood that the cost of enrollment will be a safe investment.
Union Leader: What good is altering the curricula if students simply do not have the funds to enroll or the time to attend? What we need are more generous educational grants targeted to working adults, and more flexible work hours for working students.
Both the education secretary and the union leader make the point that … ?

A the cost of higher education for many adults is prohibitively high
B many adult students do not have the time to attend courses in higher education
C the cost of higher education is unfairly high
D many adult students will not attend classes in higher education unless they are convinced that doing so will be a good investment.

34. In a political system with only two major parties, the entrance of a third-party candidate into an election race damages the chances of only one of the two major candidates. The third-party candidate always attracts some of the voters who might otherwise have voted for one of the two major candidates, but not voters who support the other candidate. Since a third-party candidacy affects the two major candidates unequally, for reasons neither of them has any control over, the practice is unfair and should not be allowed.
If the factual information in the passage above is true, which of the following can be most reliably inferred from it?

(A) If the political platform of the third party is a compromise position between that of the two major parties, the third party will draw its voters equally from the two major parties.
(B) If, before the emergence of a third party, voters were divided equally between the two major parties, neither of the major parties is likely to capture much more than one-half of the vote.
(C) A third-party candidate will not capture the votes of new voters who have never voted for candidates of either of the two major parties.
(D) The political stance of a third party will be more radical than that of either of the two major parties.

35. It is the powerful compound capsaicin that makes a chili pepper hot; a single drop that has no taste and odor is capable of detection by humans at one part per million.

(A) a single drop that has no taste and odor is capable of detection
(B) a single drop is detectable, though without taste and odor,
(C) a single tasteless and odorless drop can be detected
(D) single tasteless and odorless drops are capable of detection

36. Old, longstanding firms concentrate on protecting what they have already amassed. Consequently, they rarely innovate and often underestimate what consequences innovation by other companies will have. The best example of one such defensive strategy is the fact that ___.

Which of the following best completes the passage?
A. electronics and mass-produced gears eliminated the traditional market for pocket watches, clearing the way for marketing them as elegant, old-fashioned luxury items.
B. an extremely popular prefabricated house was introduced by a company that, several years before, had failed miserably with its product line of glass houses.
C. a once-leading maker of buggy whips responds to the new availability of stick shifts by attempting to make better buggy whips.
D. smoking pipes, originally designed for use by typically older, more traditional smokers of tobacco, are now bought mostly by young smokers of scented or flavored herbal blends.

37. Arrange the sentences A, B, C and D in a proper sequence so as to make a coherent paragraph.

A. After several routine elections there comes a 'critical' election which redefines the basic pattern of political loyalties, redraws political geography and opens up political space.
B. In psephological jargon, they call it realignment.
C. Rather, since 1989, there have been a series of semi-critical elections.
D. On a strict definition, none of the recent Indian elections qualifies as a critical election.
a. ABCD b. ABDC c. DBAC d. DCBA

38. Arrange the sentences A, B, C and D in a proper sequence so as to make a coherent paragraph.

A. Trivial pursuits marketed by the Congress, is a game imported from Italy.
B. The idea is to create an imaginary saviour in times of crisis so that the party doesn't fall flat on its collective face.
C. Closest contenders are Mani Shankar Aiyar, who still hears His Master's Voice and V. George, who is frustrated by the fact that his political future remains Sonia and yet so far.
D. The current champion is Arjun for whom all roads lead to Rome, or in this case, 10 Janpath.
a. ABDC b. ABCD c. DCBA d. CDBA

Directions for questions: Answer the questions based on the following information.
A and B are two sets (e.g. A = Mothers, B = Women).
C = A . B =>The elements that could belong to both the sets (e.g. women who are mothers) is given by the set C = A . B.
D = A ∪ B =>The elements which could belong to either A or B, or both, is indicated by the set D = A ∪ B.
ϕ => A set that does not contain any elements is known as a null set represented by ϕ (e.g. if none of the women in the set B is a mother, then C = A .B is a null set, or C = ϕ).

Let ‘V’ signify the set of all vertebrates,
‘M’ the set of all mammals,
‘D’ dogs,
‘F’ fish
‘A’ alsatian and
‘P’, a dog named Pluto.

39. Given that X = M.D is such that X = D. Which of the following is true?
a. All dogs are mammals
b. Some dogs are mammals
c. X = ϕ
d. All mammals are dogs

40. If Y = F . (D . V) is not a null set, it implies that
a. all fish are vertebrates

b. all dogs are vertebrates
c. some fish are dogs
d. None of these

41. If Z = (P . D) ∪M, then
a. the elements of Z consist of Pluto, the dog, or any other mammal
b. Z implies any dog or mammal
c. Z implies Pluto or any dog that is a mammal
d. Z is a null set

42. If P . A = ϕ and P ∪ A = D, then which of the following is true?
a. Pluto and alsatians are dogs
b. Pluto is an alsatian
c. Pluto is not an alsatian
d. D is a null set

Read each of the following passages carefully and answer the questions that follow.

Atmospheric jet streams were discovered towards the end of World War II by U.S. bomber pilots over Japan and by German reconnaissance aircraft over the Mediterranean. The World Meteorological Organization defines a jet stream as a strong, narrow air current that is concentrated along nearly horizontal axis in the upper troposphere or stratosphere (10 to 50km altitude), characterized by wind motions that produce strong vertical lateral shearing action and featuring one of more velocity maximum. Normally a jet stream is thousands of kilometers long, hundreds of kilometers wide and several kilometers deep. The vertical wind shear is of the order of 5 to 10 m/sec per kilometer, and the lateral shear is of the order of 5 m/sec per 100 km. An arbitrary lower limit of 30m/sec is assigned to the speed of the wind along the axis of a jet stream.

With abundant radio-sonic data now available over the Northern Hemisphere it is possible to map the jet streams in the upper troposphere (near 10 to 12 km) in their daily occurrence and variation and to forecast them reasonably well with numerical prediction techniques. Upper-air information from the Southern Hemisphere is still sparse. Constant-level balloons (the so-called GHOST balloons) and satellite information on temperature structure and characteristic cloud formations in the atmosphere are serving to close the data on the global jet stream distribution.

The strongest winds known in jet streams have been encountered over Japan, where speeds up to 500 km/hr (close to 300 knots) occur. A persistent band of strong winds occurs during the winter season over this region, flowing from the southwest and leading tropical air northern India into juxtaposition with polar and arctic air from Siberia. A similar region of confluence of air masses with vastly different temperatures exists over the central and eastern United States, leading to a maximum frequency of occurrence of jet streams during winter and spring.

43. An atmospheric jet stream is
(a) a rare phenomenon.
(b) three dimensional.
(c) concentrated in the northern hemisphere.
(d) more common in summer.

44. Detailed studies of atmospheric streams have been made over
(a) South Africa
(b) Europe
(c) Australia
(d) Antarctica

45. The atmospheric jet stream consists of

(a) cumulous clouds bearing saturated moisture.
(b) debris caused by meteorites.
(c) air currents.
(d) effluents from speeding aircraft.

46. Some decisions will be fairly obvious — 'no-brainers'. Your bank account is low, but you have a two week vacation coming up and you want to get away to some place warm to relax with your family. Will you accept your in-laws' offer of free use of their Florida beachfront condo? Sure. You like your employer and feel ready to move forward in your career. Will you step in for your boss for three weeks while she attends a professional development course? Of course.

Choose the option that best captures the essence of the text.
A. Some decisions are obvious under certain circumstances. You may, for example, readily accept a relative's offer of free holiday accommodation. Or step in for your boss when she is away.
B. Some decisions are no-brainers. You need not think when making them. Examples are condo offers from in-law and job offers from bosses when your bank account is low or boss is away.
C. Easy decisions are called 'no-brainers' because they do not require any cerebral activity. Examples such as accepting free holiday accommodation abound in our lives.
D. Accepting an offer from in-laws when you are short on funds and want a holiday is a no-brainer. Another no-brainer is taking the boss's job when she is away.

Direction for questions: Answer the questions based on the following information.
A series S_1 of five positive integers is such that the third term is half the first term and the fifth term is 20 more than the first term. In series S_2, the nth term defined as the difference between the (n+1) term and the nth term of series S_1, is an arithmetic progression with a common difference of 30.

47. First term of S_1 is
a. 80 b. 90 c. 100 d. 120

48. What is the difference between second and fourth terms of S_1?
a. 10 b. 20 c. 30 d. 60

49. What is the average value of the terms of series S_1?
a. 60 b. 70 c. 80 d. Average is not an integer

50. What is the sum of series S_2?
a. 10 b. 20 c. 30 d. 40

CAT 2014 based paper

Solutions

1. The passage is primarily concerned with
A. explaining why until recently scientists failed to recognize the risks presented by biocontrol agents.
Nope.Nothing like that has been mentioned.
B. emphasizing that biocontrol agents and chemical pesticides have more similarties than differences.
>>Nope.Nothing like that has been mentioned.
C. suggesting that only certain biocontrol agents should be used to control plant or animal pasts.
>>Nope,no preferance regarding any particular agent has been mentioned.
D. arguing that biocontrol agents involve risks, some of which may not be readily discerned.
"The paucity of known extinctions or disruptions resulting from indirect interactions may reflect not the infrequency of such mishaps but rather the failure to look for or to detect them: most organisms likely to be adversely affected by indirect interactions are of little or no known commercial value and the events linking a biocontrol agent with an adverse effect are often unclear"

2. The passage suggests that the author would be most likely to agree with which of the following statements about the use of biocontrol agents?
D. The risks of using native biocontrol agents may be easier to predict than the risks of using nonnative biocontrol agents.
"determining the potential risks of biocontrol agents before they are used is difficult, especially when a nonnative agent is introduced, because, unlike a chemical pesticide, a biocontrol agent may adapt in unpredictable ways. so that it can feed on or otherwise harm new hosts."

3. Which of the following is mentioned in the passage as an indirect effect of using a biocontrol agent?
D. Diminution of the positive effects conferred by a nontarget animal species.
"competing with them for resources: a biocontrol agent might reduce the benefits conferred by a desirable animal species by consuming a plant on which the animal prefers to lay its eggs."

4. The example presented by the author in highlight text most clearly serves to illustrate
B. a way in which the introduction of a biocontrol agent can affect a nontarget species.
"...in turn reducing underground ant nests and triggering the extinction of a blue butterfly that had depended on the nests to shelter its offspring."

5. b After 1, (C) states a fact about salvation. (B) states the Christian belief in that regard. (A) opposes it to Buddhism, by using 'but'. (D) elaborates the fact.

6. d After the factors stated in 1, (A) states the relationship between size of a state and development. (B) states that the problems of agricultural sector will remain with us in the next century. (C) emphasizes the need to improve agriculture. (D) states that rural India has to start moving, an idea that is continued in (6).

7. (c) There are two cases in the given question:
Case 1: If the answer is correct, then is the person belongs to the ‘No’ type of people. In this case, the person has contradicted himself by saying the truth, and ‘no’ type cannot say the truth.
Case 2: If the answer is incorrect, then the person belong to the ‘No’ type of people. This makes his answer correct and converts him into a ‘yes’ type.
Thus in both cases we arrive at a contradiction.

8. (a) Let’s take make cases again.
Case 1: none of them are ‘yes’, that is both are ‘yes’.
In this case his statement his false, and at least one will have to be ‘no’. Since Laxman lied, he has to be ‘no’.
Case 2: both of them are yes.
In this case what he said is false, and Laxman becomes a no. But this is a contradiction with our assumed result. So this is logically invalid.
In both the cases, the case is negated. Hence, options 2 and 4 can be ruled out. Now let’s take option 4. We assume Laxman lied and is a ‘no’, and Ram is ‘yes’. This is again invalid, as in this case, Laxman has said the truth (as one of them is a ‘no’). Thus, option (d) is also not possible.

9. b (B) shows the relationship between a magazine and its editor, 'editors' are referred to as 'they'. (C) states that the number of editors should be determined by the contributions it gets. (D) continues with this fact. (A) follows by using 'furthermore'.

Solution
T = tallest & opposite to Red; Shortest opposite to Green; U = orange & the position of U is: P/S U S/P; R = yellow & opposite to P ; Q = Green & opposite to U ; P = White & (S, Q) > P > R (in height)
We can deduct, T > (S, Q) > P > R > U in terms of height and form following two cases.

Height	5	2/3	1		1	2/3	5
Report Name	Richa	Qadar	Tanvi		Tanvi	Qadar	Richa
Color	yellow	green	blue		blue	green	yellow
				OR			
Color	white	Orange	Red		red	Orange	white
Report Name	Piyush	Urvashi	Sandesh		Sandesh	Urvashi	Piyush
Height	4	6	3/2		3/2	6	4

10. 4 Diagonally opposite to yellow is red.
11. 5 Second tallest Project Report is either Q or S. So, we cannot determine.
12. 2 Tallest Project Report is T whose colour is Blue.
13. 4. Richa is yellow colored report

14. When we call others dogmatic, what we really object to is ___ their holding beliefs that are different from our own. This is the only phrase that fits here.

15. Correct answer is D
a) realize that science relies on imagination to approach absolute truth: No it does not rely on imagination because imagination itself is influenced by cultural contexts
b) insist on pure and unsullied facts rather than on theories: Nowhere is this mentioned that scientists should insist on facts
c) understand that theories are frequently strict inductions from facts: The opposite is mentioned here "Theories, moreover, are not inexorable inductions from facts"
d) consider the cultural biases of scientists: Correct, this seems to capture what is central to the argument that scientific results are influenced by cultural contexts.

16. Structure of argument:
lack of Sunlight ----> causes --> Seasonal depression.
C.H --> inc level of sero -> mood.
C.H acts as anti depression.
From this Clearly the answer is D.
(A) Seasonal depression is one of the most easily treated forms of depression.
No. There is no comparison made with other forms of depression.
(B) Lack of sunlight lowers the level of serotonin in the brain.
No. Not mentioned.
(C) People are more likely to be depressed in midwinter than at other times of the year.
No. Nothing about other seasons mentioned.
(D) Some antidepressants act by changing the brain's level of serotonin.

17. Solution: This Specific question asks what is true about partisan journalism throughout American history. What is stated is that since its beginning, the press has not significantly changed. The passage additionally says that like newspapers today, newspapers at the time of America's birth were all partisan, thereby making (D) the correct response. (A) is incorrect because the passage states that the commitment to a free press is a necessary ingredient for the political process to function properly. (B) is incorrect because the first paragraph does state that partisan journalism can be good journalism. (C) is incorrect because while partisan journalism has played an important role in informing individuals, we have no way of knowing whether it has done so reliably.

18. Solution: The opening paragraph states, “American newspapers at the time of this nation’s birth were all partisan, believing that their responsibility was not to report news, but to convey, without apology, a particular political position.” Therefore, one can conclude that early American journalists did not always present a balanced perspective, making (D) the correct response. (A) is incorrect because the passage does not compare the form of past newspapers with that of today’s papers. (B) is incorrect because it is in sharp contrast to what the fourth sentence of the first paragraph states. “Yet, since the time of America’s founding, the politicized nature of the press has not fundamentally changed.” (C) is incorrect because the press has always been politically biased; it is not a recent phenomenon.

19. Solution: In this question, four of the answer choices will contain statements that the author will agree with. The author would agree with answer choices (A) and (C) because of the statements in the following sentence: “Over time, older laws that allowed publications to be punished for libel, obscenity, sedition, and publishing inflammatory material have given way to more expansive rights to publish.” The author would agree with (D). “During the 1960’s and 1970’s, journalists exposed the government’s mismanagement of the Vietnam War and their investigative reporting eventually brought about the resignation of President Nixon.” The author would not agree with answer choice (B). The passage states that courts have continuously reinterpreted what is meant by freedom of the press. Therefore, the author would not agree that First Amendment protections are absolute, making (B) the correct response.

20. This is a Specific question in which four of the answers will be found within the passage. The one that cannot be found from information in the passage is the answer to this EXCEPT question. (A), (B), (D) are contained in the passage. They are all paraphrases of the second sentence of the third paragraph, which says, “Over time, older laws that allowed publications to be punished for libel, obscenity, sedition, and publishing inflammatory material have given way to more expansive rights to publish.” The passage does say that the mainstream press has always been politically biased, making (C) the EXCEPTION and the correct answer.

21. Actually, the only nations that have adopted such regulations are farther from the equator than the continental United States. this wants to convey that on earth united states is near to the equator and all those nations who have adopted this regulation...they are more far from equator than is united states.
two facts given:
less visibility => in farther place from euator.
these places(where regulation is adopted) => such regulation will be more successful.
hence we can conclude D is answer.

22. The argument says before Twentieth-century the engineering team followed "rules of thumb to build bridges. Quebec Bridge in 1907 collasped even after following rules...therefore these rules were not sufficient/safe and engineers started depending on far more rigorous applications of mathematical analysis
Only A summarizes the given argument....
B....we don't know this....passage doesnot mention that coopers absence led to the accident
C..We dont have any information of bridges built before 1907...so OFS
D..OFS....we dont know this....

23. B, Its directly evident from last 2 lines where in the author says that woman is trying to imitate male-art. Hence answer should be B.

Game	Opening	Players Pick		Dealer's Pick		Closing
	Balance	Debit (-)	Credit (+)	Debit (-)	Credit (+)	Balance
1	0	0	8	16	0	-8
2	-8	0	10	0	10	12
3	12	0	6	6	0	12
4	12	0	8	16	0	4

24. A. the maximum gain is Rs. 12

25. B. Since the maximum loss that Rajesh can go to is –8, he should begin with at least Rs. 8, so that he does not have to borrow any money at any point.
26. D. In four games, Rajesh makes a profit of Rs. 4. if the final amount left with Rajesh is Rs. 100, the initial amount that he had would be Rs. 96.
27. C. According to the table maximum loss is -8 Rs.

28. c Ants attack strangers who might belong to the same species.
29. d If they did so they would have been unable to communicate with the drunken ants.
30. d Chloroform killed the ants.

31. Incoherent statement is C. For RIL, refining and selling oil and making petrochemicals are not new. Investors understand these businesses and value them realistically.
Each of the other statement talks about reliance and its financial results.

32. Incoherent Statement is C. Rest of the statements are correlated which C is just stating the fact that Sachin is a member of Rajya Sabha.

33. Here is logic to arrive at the answer A)
A) "the cost of higher education for many adults is prohibitively high"
Both of them agree that the high cost of higher education. Correct.
B) many adult students do not have the time to attend courses in higher education
Only Union Leader, and not the Education Secretary, points to lack of time. Incorrect.
C)the cost of higher education is unfairly high
Although this option looks similar to A), it is incorrect due to the use of the word "unfairly". We don't know whether high cost of higher education is justified or not. Incorrect.
D) many adult students will not attend classes in higher education unless they are convinced that doing so will be a good investment.
This cannot be concluded from the statements. Incorrect.

34. Premise 1: In a political system with only two major parties, the entrance of a third-party candidate into an election race damages the chances of only one of the two major candidates.
Premise 2: The third-party candidate always attracts some of the voters who might otherwise have voted for one of the two major candidates, but not voters who support the other candidate.
Conclusion: Since a third-party candidacy affects the two major candidates unequally, for reasons neither of them has any control over, the practice is unfair and should not be allowed.

A. If the political platform of the third party is a compromise position between that of the two major parties, the third party will draw its voters equally from the two major parties. As per premise 1 only 1 of the parties should get affected not both, so this is incorrect.
B. If, before the emergence of a third party, voters were divided equally between the two major parties, neither of the major parties is likely to capture much more than one-half of the vote. As per premise 1 only 1 of the parties should get affected not both, so this is incorrect.

C. A third-party candidate will not capture the votes of new voters who have never voted for candidates of either of the two major parties. Passage says third candidate affects one of the major parties candidate by drawing his/her voters, so it can be assumed that new voters who never voted might not vote from this third candidate.
D. The political stance of a third party will be more radical than that of either of the two major parties. The passage does not support that third party will have radical views.

35. It is the powerful compound capsaicin that makes a chili pepper hot; a single drop that has no taste and odor is capable of detection by humans at one part per million.
>> After semicolon, the next sentence need to be an IC. All options appears to be ICs :lol:
>> When a word is used in several ways (as Noun, Adj, Verb) preference goes as per VAN rule (Verb>Adj>Noun). So, detected > detectable > detection.

(A) a single drop that has no taste and odor is capable of detection >> wordy+violets VAN rule
(B) a single drop is detectable, though without taste and odor, >> violets VAN rule
(C) a single tasteless and odorless drop can be detected >> favors VAN rule
(D) single [tasteless and odorless drops] are capable of detection >> SVA issue+violets VAN rule+wordy

36. Conclusion – Old firms don't innovate & underestimate other companies that do.
Evidence – Old firms concentrate on protecting what they have.
Assumptions – Protecting what you have = NOT innovating
What's the blank represent? An example that will prove the author's point.
Prediction: An old firm that didn't innovate & suffered as a result of another company that did.
A. Incorrect. This is contradictory since the traditional pocket watch makers changed their marketing (and thus innovated.)
B. Incorrect. This is contradictory since it shows a company that innovated.
C. Correct! Here an old buggy whip firm does not innovate and simply focuses on what they already have.
D. Incorrect. This focuses on the consumer. We would consider this "out of scope" since our argument focuses on the producers.

37. A. B talks about the previous records of mid-term elections, and its implications on the present situation, A presents a contradictory fact, and C states the implications of this fact. D concludes the passage.

38. B. A introduces critical elections as the subject of the passage, B explains it, D states that none of the Indian elections so far has been a critical election, instead as C states, there have been many semi-critical ones.

39. A. Let ∩ means common M ∩ D means there are some M who are D
(1) X = M.D = M ∩ D - means there are some M who are D
(2) X = D – means all X are Dogs
Combining both (1) and (2) M ∩ D = D
⇒ D ⊂ M; Thus all dogs are mammals.

40. C.
Y = F . (D . V) = F ∩ (D ∩ V) is not a null set - means some F are D and some D are V.
That means some F ∩D. fish are dogs.

41. A.
Z = (P.D)∪M = (P ∩ D) ∪ M means Some P are D and All of them are M.
P ∩ D means pluto the dog.
P ∩D ∪ M means pluto the dog or any other mammal.

42. C.
P.A = ϕ P ∪ A = D
P ∩ A = ϕ means no alsations are pluto or pluto is not an alsation where dogs are composed of alsation or pluto or both.

43. B. A jet stream has length, width as well as depth.
44. b Most data is available over the Northern hemisphere.
45. c A jet stream is defined as 'a strong, narrow air current'.

46. A. Some decisions are obvious under certain circumstances. You may, for example, readily accept a relative's offer of free holiday accommodation. Or step in for your boss when she is away.
A is unambiguous, so right choice for the essence.

B. Some decisions are no-brainers. You need not think when making them. Examples are condo offers from in-law and job offers from bosses when your bank account is low or boss is away.
B is not right because the boss did not offer any job.
C. Easy decisions are called 'no-brainers' because they do not require any cerebral activity. Examples such as accepting free holiday accommodation abound in our lives.
C is wrong because free holiday accommodation does not come that frequently in our lives.
D. Accepting an offer from in-laws when you are short on funds and want a holiday is a no-brainer. Another no-brainer is taking the boss's job when she is away.
D is wrong because you never take the boss's job when she is away.

Answers:
First series: (S_1) = m, n, m/2, p, m + 20
Second series: (S_2) = a1, a2, a3, a4
Now a_1 = n – m, a_2 = m/2 – n, a_3 = p – m/2 and a_4 = m + 20 – p
$a_2 - a_1 = 30$ gives $3m - 4n = 60$ ... (i)
$a_4 - a_3 = 30$ gives $3m - 4p = 20$ ... (ii)
and $a_4 - a_2 = 60$ gives $m - 2p + 2n = 80$ ... (iii)
Solving these equations we get the values of m = 100,
n = 60, p = 70
Therefore S_1 = 100, 60, 50, 70, 120
S_2 = –40, –10, 20, 50
47. c
48. a
49. c
50. b

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