

# CAT 1999 Actual Paper

## Section – I

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**Directions for questions 1 to 5:** 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 the sentences from among the four given choices to construct a coherent paragraph.

1. 

A. In rejecting the functionalism in positivist organization theory, either wholly or partially, there is often a move towards a political model of organization theory.

B. Thus, the analysis would shift to the power resources possessed by different groups in the organization and the way they use these resources in actual power plays to shape the organizational structure.

C. At the extreme, in one set of writings, the growth of administrators in the organization is held to be completely unrelated to the work to be done and to be caused totally by the political pursuit of self-interest.

D. The political model holds that individual interests are pursued in organizational life through the exercise of power and influence.

a. ADBC                      b. CBAD                      c. DBCA                      d. ABDC
2. 

A. Group decision-making, however, does not necessarily fully guard against arbitrariness and anarchy, for individual capriciousness can get substituted by collusion of group members.

B. Nature itself is an intricate system of checks and balances, meant to preserve the delicate balance between various environmental factors that affect our ecology.

C. In institutions also, there is a need to have in place a system of checks and balances which inhibits the concentration of power in the hands of only some individuals.

D. When human interventions alter this delicate balance, the outcomes have been seen to be disastrous.

a. CDAB                      b. BCAD                      c. CABD                      d. BDCA
3. 

A. He was bone-weary and soul-weary, and found himself muttering, "Either I can't manage this place, or it's unmanageable."

B. To his horror, he realized that he had become the victim of an amorphous, unwitting, unconscious conspiracy to immerse him in routine work that had no significance.

C. It was one of those nights in the office when the office clock was moving towards four in the morning and Bennis was still not through with the incredible mass of paper stacked before him.

D. He reached for his calendar and ran his eyes down each hour, half-hour, and quarter-hour, to see where his time had gone that day, the day before, the month before.

a. ABCD                      b. CADB                      c. BDCA                      d. DCBA

4. A. With that, I swallowed the shampoo, and obtained the most realistic results almost on the spot.  
 B. The man shuffled away into the back regions to make up a prescription, and after a moment I got through on the shop-telephone to the Consulate, intimating my location.  
 C. Then, while the pharmacist was wrapping up a six-ounce bottle of the mixture, I groaned and inquired whether he could give me something for acute gastric cramp.  
 D. I intended to stage a sharp gastric attack, and entering an old-fashioned pharmacy, I asked for a popular shampoo mixture, consisting of olive oil and flaked soap.
- a. DCBA                      b. DACB                      c. BDAC                      d. BCDA
5. A. Since then, intelligence tests have been mostly used to separate dull children in school from average or bright children, so that special education can be provided to the dull.  
 B. In other words, intelligence tests give us a norm for each age.  
 C. Intelligence is expressed as intelligence quotient, and tests are developed to indicate what an average child of a certain age can do .... What a five-year-old can answer, but a four-year-old cannot, for instance.  
 D. Binet developed the first set of such tests in the early 1900s to find out which children in school needed special attention.  
 E. Intelligence can be measured by tests.
- a. CDABE                      b. DECAB                      c. EDACB                      d. CBADE

**Directions for questions 6 to 13:** Read each of the eight short passages given below and answer the question that follow it.

6. Three airlines — IA, JA and SA — operate on the Delhi- Mumbai route. To increase the number of seats sold, SA reduced its fares and this was emulated by IA and JA immediately. The general belief was that the volume of air travel between Delhi and Mumbai would increase as a result.

Which of the following, if true, would add credence to the general belief?

- a. Increase in profitability of the three airlines.  
 b. Extension of the discount scheme to other routes.  
 c. A study that shows that air travellers in India are price-conscious.  
 d. A study that shows that as much as 80 per cent of air travel in India is company-sponsored.
7. According to McNeill, a Brahmin priest was expected to be able to recite at least one of the Vedas. The practice was essential for several centuries when the Vedas had not yet been written down. It must have had a selective effect, since priests would have been recruited from those able or willing to memorize long passages. It must have helped in the dissemination of the work, since a memorized passage can be duplicated many times.

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

- a. Reciting the Vedas was a Brahmin's obligation.  
 b. The Vedic priest was like a recorded audio cassette.  
 c. McNeill studied the behaviour of Brahmin priests.  
 d. Vedic hymns had not been scripted.
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8. Developed countries have made adequate provisions for social security for senior citizens. State insurers (as well as private ones) offer medicare and pension benefits to people who can no longer earn. In India, with the collapse of the joint family system, the traditional shelter of the elderly has disappeared. And the state faced with a financial crunch is not in a position to provide social security. So, it is advisable that the working population give serious thought to building a financial base for itself.

Which one of the following, if it were to happen, weakens the conclusions drawn in the above passage the most?

- a. The investible income of the working population, as a proportion of its total income, will grow in the future.
  - b. The insurance sector is underdeveloped and trends indicate that it will be extensively privatized in the future.
  - c. India is on a path of development that will take it to a developed country status, with all its positive and negative implications.
  - d. If the working population builds a stronger financial base, there will be a revival of the joint family system.
9. Various studies have shown that our forested and hilly regions and, in general, areas where biodiversity — as reflected in the variety of flora — is high, are the places where poverty appears to be high. And these same areas are also the ones where educational performance seems to be poor. Therefore, it may be surmised that, even disregarding poverty status, richness in biodiversity goes hand in hand with educational backwardness.

Which one of the following statements, if true, can be said to best provide supporting evidence for the surmise mentioned in the passage?

- a. In regions where there is little variety in flora, educational performance is seen to be as good as in regions with high variety in flora, where poverty levels are high.
  - b. Regions which show high biodiversity also exhibit poor education performance, at low levels of poverty.
  - c. Regions which show high biodiversity reveal high levels of poverty and poor educational performance.
  - d. In regions where there is low biodiversity, at all levels of poverty, educational performance is seen to be good.
10. Cigarettes constitute a mere 20 per cent of tobacco consumption in India, and fewer than 15 per cent of the 200 million tobacco users consume cigarettes. Yet these 15 per cent contribute nearly 90 per cent of the tax revenues to the exchequer from the tobacco sector. The punitive cigarette taxation regime has kept the tax base narrow, and reducing taxes will expand this base.

Which of the following best bolsters the conclusion that reducing duties will expand the tax base?

- a. The cigarette manufacturers' association has decided to indulge in aggressive promotion.
  - b. There is a likelihood that tobacco consumers will shift to cigarette smoking if cigarette prices were to reduce.
  - c. The cigarette manufacturers are lobbying for a reduction on duties.
  - d. An increase in duties on non-cigarette tobacco may lead to a shift in favour of cigarette smoking.
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11. Thomas Malthus, the British clergyman-turned economist, predicted that the planet would not be able to support the human population for long. His explanation was that human population grows at a geometric rate, while the food supply grows only at an arithmetic rate.

Which one of the following, if true, would not undermine the thesis offered by Malthus?

- a. Population growth can be slowed down by the voluntary choices of individuals and not just by natural disasters.
  - b. The capacity of the planet to feed a growing human population can be enhanced through biotechnological means.
  - c. Human systems, and natural systems like food supply, follow natural laws of growth which have remained constant, and will remain unchanged.
  - d. Human beings can colonize other planetary systems on a regular and ongoing basis to accommodate a growing population.
12. The company's coffee crop for 1998-99 totalled 8,079 tonnes, an all-time record. The increase over the previous year's production of 5,830 tonnes was 38.58 per cent. The previous highest crop was 6,089 tonnes in 1970-71. The company had fixed a target of 8,000 tonnes to be realized by the year 2000-01, and this has been achieved two years earlier, thanks to the emphasis laid on the key areas of irrigation, replacement of unproductive coffee bushes, intensive refilling and improved agricultural practices. It is now our endeavour to reach the target of 10,000 tonnes in 2001-02.

Which one of the following would contribute most to making the target of 10,000 tonnes in 2001-02 unrealistic?

- a. The potential of the productivity enhancing measures implemented up to now has been exhausted.
  - b. The total company land under coffee has remained constant since 1969 when an estate in the Nilgiri Hills was acquired.
  - c. The sensitivity of the crop to climatic factors makes predictions about production uncertain.
  - d. The target-setting procedures in the company had been proved to be sound by the achievement of the 8,000 tonnes target.
13. Animals, in general, are shrewd in proportion as they cultivate society. Elephants and beavers show the greatest signs of this sagacity when they are together in large numbers, but when man invades their communities they lose all their spirit of industry. Among insects, the labours of the bee and the ant have attracted the attention and admiration of naturalists, but all their sagacity seems to be lost upon separation, and a single bee or ant seems destitute of every degree of industry. It becomes the most stupid insect imaginable, and it languishes and soon dies.

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

- a. Humankind is responsible for the destruction of the natural habitat of animals and insects.
  - b. Animals, in general, are unable to function effectively outside their normal social environment.
  - c. Naturalists have great admiration for bees and ants, despite their lack of industry upon separation.
  - d. Elephants and beavers are smarter than bees and ants in the presence of human beings.
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**Directions for questions 14 and 15:** For each of the two questions, indicate which of the statements given with that particular question is consistent with the description of the unseasonable man in the passage below.

Unseasonableness is a tendency to do socially permissible things at the wrong time. The unseasonable man is the sort of person who comes to confide in you when you are busy. He serenades his beloved when she is ill. He asks a man who has just lost money by paying a bill for a friend to pay a bill for him. He invites a friend to go for a ride just after the friend has finished a long car trip. He is eager to offer services which are not wanted, but which cannot be politely refused. If he is present at an arbitration, he stirs up dissension between the two parties, who were really anxious to agree. Such is the unseasonable man.

14. He tends to
- entertain women.
  - be a successful arbitrator when dissenting parties are anxious to agree.
  - be helpful when solicited.
  - tell a long story to people who have heard it many times before.
15. The unseasonable man tends to
- bring a higher bidder to a salesman who has just closed a deal.
  - disclose confidential information to others.
  - sing the praises of the bride when he goes to a wedding.
  - sleep late and rise early.

**Directions for questions 16 to 23:** In each of the following sentences, a part of the sentence is underlined. Beneath each sentence, four different ways of phrasing the underlined part are indicated. Choose the best alternative among the four.

16. It was us who had left before he arrived.
- we who had left before time he had arrived.
  - us who had went before he arrived.
  - us who had went before had arrived.
  - we who had left before he arrived.
17. The MP rose up to say that in her opinion, she thought the Women's Reservation Bill should be passed on unanimously.
- rose to say that she thought the Women's Reservation Bill should be passed
  - rose up to say that, the Women's Reservation Bill should be passed on
  - rose to say that, in her opinion, she thought that the Women's Reservation Bill should be passed
  - rose to say that, in her opinion, the Women's Reservation Bill should be passed on
18. Mr Pillai, the president of the union and who is also a member of the community group, will be in charge of the negotiations.
- since he is a member of the community group
  - also being a member of the community group
  - a member of the community group
  - in addition, who is a member of the community group
-

19. Since the advent of cable television, at the beginning of this decade, the entertainment industry took a giant stride forward in our country.
- this decade saw the entertainment industry taking
  - this decade, the entertainment industry has taken
  - this decade, the entertainment industry had taken
  - this decade, the entertainment industry took
20. His mother made great sacrifices to educate him, moving house on three occasions, and severing the thread on her loom's shuttle whenever Mencius neglected his lessons to make him understand the need to persevere.
- severing the thread on her loom's shuttle whenever Mencius neglected his lessons to make him understand the need to persevere.
  - severed the thread on her loom's shuttle whenever Mencius neglected his lessons to make him understand the need to persevere.
  - severed the thread on her loom's shuttle whenever Mencius neglected his lessons to make him understand the need for persevering.
  - severing the thread on her loom's shuttle whenever Mencius neglected his lessons to make them understand the need to persevere.
21. If you are in a three-month software design project and, in two weeks, you've put together a program that solves part of the problem, show it to your boss without delay.
- and, you've put together a program that solves part of the problem in two weeks
  - and, in two weeks, you've put together a program that solves part of the problem
  - and, you've put together a program that has solved part of the problem in two weeks
  - and, in two weeks, you put together a program that solved only part of the problem
22. Many of these environmentalists proclaim to save nothing less than the planet itself.
- to save nothing lesser than
  - that they are saving nothing lesser than
  - to save nothing less than
  - that they save nothing less than
23. Bacon believes that the medical profession should be permitted to ease and quicken death where the end would otherwise only delay for a few days and at the cost of great pain.
- be delayed for a few days
  - be delayed for a few days and
  - be otherwise only delayed for a few days and
  - otherwise only delay for a few days and
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**Directions for questions 24 to 50:** Each of the five passages given below is followed by questions. For each question, choose the best answer.

### Passage – I

The World Trade Organization (WTO) was formed in the early 1990s as a component of the Uruguay Round negotiation. However, it could have been negotiated as part of the Tokyo Round of the 1970s, since that negotiation was an attempt at a 'constitutional reform' of the General Agreement on Tariffs and Trade (GATT). Or it could have been put off to the future, as the US Government wanted. What factors led to the creation of the WTO in the early 1990s?

One factor was the pattern of multilateral bargaining that developed late in the Uruguay Round. Like all complex international agreements, the WTO was a product of a series of trade-offs between principal actors and groups. For the United States, which did not want a new organization, the dispute settlement part of the WTO package achieved its longstanding goal of a more effective and more legal dispute settlement system. For the Europeans, who by the 1990s had come to view GATT dispute settlement less in political terms and more as a regime of legal obligations, the WTO package was acceptable as a means to discipline the resort to unilateral measures by the United States. Countries like Canada and other middle and smaller trading partners were attracted by the expansion of a rules-based system and by the symbolic value of a trade organization, both of which inherently support the weak against the strong. The developing countries were attracted due to the provisions banning unilateral measures. Finally, and perhaps most important, many countries at the Uruguay Round came to put a higher priority on the export gains than on the import losses that the negotiation would produce, and they came to associate the WTO and a rules-based system with those gains. This reasoning — replicated in many countries — was contained in US Ambassador Kantor's defence of the WTO, and it amounted to a recognition that international trade and its benefits cannot be enjoyed unless trading nations accept the discipline of a negotiated rules-based environment.

A second factor in the creation of the WTO was pressure from lawyers and the legal process. The dispute settlement system of the WTO was seen as a victory of legalists over pragmatists but the matter went deeper than that. The GATT, and the WTO, are contract organizations based on rules, and it is inevitable that an organization created to further rules will in turn be influenced by the legal process. Robert Hudec has written of the 'momentum of legal development', but what is this precisely? Legal development can be defined as promotion of the technical legal values of consistency, clarity (or, certainty) and effectiveness: these are values that those responsible for administering any legal system will seek to maximize. As it played out in the WTO, consistency meant integrating under one roof the whole lot of separate agreements signed under GATT auspices; clarity meant removing ambiguities about the powers of contracting parties to make certain decisions or to undertake waivers: and effectiveness meant eliminating exceptions arising out of grandfather-rights and resolving defects in dispute settlement procedures and institutional provisions. Concern for these values is inherent in any rules-based system of cooperation, since without these values, rules would be meaningless in the first place. Rules, therefore, create their own incentive for fulfilment.

The momentum of legal development has occurred in other institutions besides the GATT, most notably in the European Union (EU). Over the past two decades the European Court of Justice (ECJ) has consistently rendered decisions that have expanded incrementally the EU's internal market, in which the doctrine of

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'mutual recognition' handed down in the case *Cassis de Dijon* in 1979 was a key turning point. The court is now widely recognized as a major player in European integration, even though arguably such a strong role was not originally envisaged in the Treaty of Rome, which initiated the current European Union. One means the court used to expand integration was the 'teleological method of interpretation', whereby the actions of member states were evaluated against 'the accomplishment of the most elementary community goals set forth in the Preamble to the [Rome] Treaty'. The teleological method represents an effort to keep current policies consistent with stated goals, and it is analogous to the effort in GATT to keep contracting party trade practices consistent with stated rules. In both cases legal concerns and procedures are an independent force for further cooperation.

In large part, the WTO was an exercise in consolidation. In the context of a trade negotiation that created a near-revolutionary expansion of international trade rules, the formation of the WTO was a deeply conservative act needed to ensure that the benefits of the new rules would not be lost. The WTO was all about institutional structure and dispute settlement: these are the concerns of conservatives and not revolutionaries, which is why lawyers and legalists took the lead on these issues. The WTO codified the GATT institutional practice that had developed by custom over three decades, and it incorporated a new dispute settlement system that was necessary to keep both old and new rules from becoming a sham. Both the international structure and the dispute settlement system were necessary to preserve and enhance the integrity of the multilateral trade regime that had been built incrementally from the 1940s to the 1990s.

24. What could be the closest reason why the WTO was not formed in the 1970s?
    - a. The US government did not like it.
    - b. Important players did not find it in their best interest to do so.
    - c. Lawyers did not work for the dispute settlement system.
    - d. The Tokyo Round negotiation was an attempt at constitutional reform.
  
  25. The most likely reason for the acceptance of the WTO package by nations was that
    - a. it had the means to prevent the US from taking unilateral measures.
    - b. they recognized the need for a rule-based environment to protect the benefits of increased trade.
    - c. it settles disputes more legally and more effectively.
    - d. its rule-based system leads to export gains.
  
  26. According to the passage, WTO promoted the technical legal values partly through
    - a. integrating under one roof the agreements signed under GATT.
    - b. rules that create their own incentive for fulfilment.
    - c. grandfather-rights exceptions and defects in dispute settlement procedures.
    - d. ambiguities about the powers of contracting parties to make certain decisions.
  
  27. In the method of interpretation of the European Court of Justice,
    - a. current policies needed to be consistent with stated goals.
    - b. contracting party trade practices needed to be consistent with stated rules.
    - c. enunciation of the most elementary community goals needed to be emphasised.
    - d. actions of member states needed to be evaluated against the stated community goals.
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28. In the statement “. . . it amounted to a recognition that international trade and its benefits cannot be enjoyed unless trading nations accept the discipline of a negotiated rules-based environment”, ‘it’ refers to
- Ambassador Kantor’s defence of the WTO.
  - the higher priority on export gains placed by many countries at the Uruguay Round.
  - the export gains many countries came to associate with a rule-based system.
  - the provision of a rule-based system by the WTO.
29. The importance of Cassis de Dijon is that it
- gave a new impetus to the momentum of legal development at the European Court of Justice.
  - resulted in a decision that expanded incrementally the EU’s internal market.
  - strengthened the role of the court more than envisaged in the Treaty of Rome.
  - led to a doctrine that was a key turning point in European integration.

## Passage – 2

Have you ever come across a painting, by Picasso, Mondrian, Miro, or any other modern abstract painter of this century, and found yourself engulfed in a brightly-coloured canvas which your senses cannot interpret? Many people would tend to denounce abstractionism as senseless trash. These people are disoriented by Miro’s bright, fanciful creatures and two-dimensional canvases. They click their tongues and shake their heads at Mondrian’s grid works, declaring that the poor guy played too many scrabble games. They silently shake their heads in sympathy for Picasso, whose gruesome, distorted figures must be a reflection of his mental health. Then, standing in front of a work by Charlie Russell, the famous western artist, they’ll declare it a work of God. People feel more comfortable with something they can relate to and understand immediately without too much thought. This is the case with the work of Charlie Russell. Being able to recognize the elements in his paintings — trees, horses and cowboys — gives people a safety line to their world of ‘reality’. There are some who would disagree when I say abstract art requires more creativity and artistic talent to produce a good piece than does representational art, but there are many weaknesses in their arguments.

People who look down on abstract art have several major arguments to support their beliefs. They feel that artists turn abstract because they are not capable of the technical drafting skills that appear in a Russell: therefore, such artists create an art form that anyone is capable of and that is less time consuming, and then parade it as artistic progress. Secondly, they feel that the purpose of art is to create something of beauty in an orderly, logical composition. Russell’s compositions are balanced and rational: everything sits calmly on the canvas, leaving the viewer satisfied that he has seen all there is to see. The modern abstractionists, on the other hand, seem to compose their pieces irrationally. For example, upon seeing Picasso’s Guernica, a friend of mine asked me, “What’s the point?” Finally, many people feel that art should portray the ideal and real. The exactness of detail in Charlie Russell’s work is an example of this. He has been called a great historian because his pieces depict the lifestyle, dress, and events of the times. His subject matter is derived from his own experiences on the trail, and reproduced to the smallest detail.

I agree in part with many of these arguments, and at one time even endorsed them. But now, I believe differently. Firstly, I object to the argument that abstract artists are not capable of drafting. Many abstract

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artists, such as Picasso, are excellent draftsmen. As his work matured, Picasso became more abstract in order to increase the expressive quality of his work. Guernica was meant as a protest against the bombing of that city by the Germans. To express the terror and suffering of the victims more vividly, he distorted the figures and presented them in a black and white journalistic manner. If he had used representational images and colour, much of the emotional content would have been lost and the piece would not have caused the demand for justice that it did. Secondly, I do not think that a piece must be logical and aesthetically pleasing to be art. The message it conveys to its viewers is more important. It should reflect the ideals and issues of its time and be true to itself, not just a flowery, glossy surface. For example, through his work, Mondrian was trying to present a system of simplicity, logic, and rational order. As a result, his pieces did end up looking like a scrabble board.

Miro created powerful, surrealistic images from his dreams and subconscious. These artists were trying to evoke a response from society through an expressionistic manner. Finally, abstract artists and representational artists maintain different ideas about 'reality'. To the representational artist, reality is what he sees with his eyes. This is the reality he reproduces on canvas. To the abstract artist, reality is what he feels about what his eyes see. This is the reality he interprets on canvas. This can be illustrated by Mondrian's Trees series. You can actually see the progression from the early recognizable, though abstracted Trees, to his final solution, the grid system.

A cycle of abstract and representational art began with the first scratchings of prehistoric man. From the abstractions of ancient Egypt to representational, classical Rome, returning to abstractionism in early Christian art and, so on up to the present day, the cycle has been going on. But this day and age may witness its death through the camera. With film, there is no need to produce finely detailed, historical records manually; the camera does this for us more efficiently. Maybe, representational art would cease to exist. With abstractionism as the victor of the first battle, maybe, a different kind of cycle will be touched off. Possibly, some time in the distant future, thousands of years from now, art itself will be physically non-existent. Some artists today believe that once they have planned and constructed a piece in their mind, there is no sense in finishing it with their hands; it has already been done and can never be duplicated.

30. The author argues that many people look down upon abstract art because they feel that
    - a. modern abstract art does not portray what is ideal and real.
    - b. abstract artists are unskilled in matters of technical drafting.
    - c. abstractionists compose irrationally.
    - d. All of the above
  31. The author believes that people feel comfortable with representational art because
    - a. they are not engulfed in brightly-coloured canvases.
    - b. they do not have to click their tongues and shake their heads in sympathy.
    - c. they understand the art without putting too much strain on their minds.
    - d. paintings like Guernica do not have a point.
  32. In the author's opinion, Picasso's Guernica created a strong demand for justice since
    - a. it was a protest against the German bombing of Guernica.
    - b. Picasso managed to express the emotional content well with his abstract depiction.
    - c. it depicts the terror and suffering of the victims in a distorted manner.
    - d. it was a mature work of Picasso, painted when the artist's drafting skills were excellent.
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33. The author acknowledges that Mondrian's pieces may have ended up looking like a scrabble board because
- many people declared the poor guy played too many scrabble games.
  - Mondrian believed in the 'grid-works' approach to abstractionist painting.
  - Mondrian was trying to convey the message of simplicity and rational order.
  - Mondrian learned from his Tree series to evolve a grid system.
34. The main difference between the abstract artist and the representational artist in matter of the 'ideal' and the 'real', according to the author, is
- how each chooses to deal with 'reality' on his or her canvas.
  - the superiority of interpretation of reality over production of reality.
  - the different values attached by each to being a historian.
  - the varying levels of drafting skills and logical thinking abilities.

### Passage – 3

Each one has his reasons: for one, art is a flight; for another, a means of conquering. But one can flee into a hermitage, into madness, into death. One can conquer by arms. Why does it have to be writing? Because, behind the various aims of authors, there is a deeper and more immediate choice which is common to all of us. We shall try to elucidate this choice, and we shall see whether it is not in the name of this very choice of writing that the engagement of writers must be required.

Each of our perceptions is accompanied by the consciousness that human reality is a 'revealer'. That is, it is through human reality that 'there is' being, or, to put it differently, that man is the means by which things are manifested. It is our presence in the world which multiplies relations. It is we who set up a relationship between this tree and that bit of sky. Thanks to us, that star which has been dead for millennia, that quarter moon, and that dark river are disclosed in the unity of a landscape. It is the speed of our auto and our airplane which organizes the great masses of the earth. With each of our acts, the world reveals to us a new face. But, if we know that we are directors of being, we also know that we are not its producers. If we turn away from this landscape, it will sink back into its dark permanence. At least, it will sink back: there is no one mad enough to think that it is going to be annihilated. It is we who shall be annihilated, and the earth will remain in its lethargy until another consciousness comes along to awaken it. Thus, to our inner certainty of being 'revealers' is added that of being inessential in relation to the thing revealed.

One of the chief motives of artistic creation is certainly the need of feeling that we are essential in relationship to the world. If I fix on canvas or in writing a certain aspect of the fields or the sea or a look on someone's face which I have disclosed, I am conscious of having produced them by condensing relationships, by introducing order where there was none, by imposing the unity of mind on the diversity of things. That is, I think myself essential in relation to my creation. But this time it is the created object which escapes me; I cannot reveal and produce at the same time. The creation becomes inessential in relation to the creative activity. First of all, even if it appears to others as definitive, the created object always seems to us in a state of suspension; we can always change this line, that shade, that word. Thus, it never forces itself. A novice painter asked his teacher, 'When should I consider my painting finished?' And the teacher answered, "When you can look at it in amazement and say to yourself 'I'm the one who did that!'"

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Which amounts to saying 'never'. For, it is virtually considering one's work with someone else's eyes and revealing what has been created. But it is self-evident that we are proportionally less conscious of the thing produced and more conscious of our productive activity. When it is a matter of poetry or carpentry, we work according to traditional norms, with tools whose usage is codified; it is Heidegger's famous 'they' who are working with our hands. In this case, the result can seem to us sufficiently strange to preserve its objectivity in our eyes. But if we ourselves produce the rules of production, the measures, the criteria, and if our creative drive comes from the very depths of our heart, then we never find anything but ourselves in our work. It is we who have invented the laws by which we judge it, it is our history, our love, our gaiety that we recognize in it. Even if we should regard it without touching it any further, we never receive from it that gaiety or love. We put them into it. The results which we have obtained on canvas or paper never seem to us objective. We are too familiar with the processes of which they are the effects. These processes remain a subjective discovery: they are ourselves, our inspiration, our ruse, and when we seek to perceive our work, we create it again, we repeat mentally the operations which produced it; each of its aspects appears as a result. Thus, in the perception, the object is given as the essential thing and the subject as the inessential. The latter seeks essential in the creation and obtains it, but then it is the object which becomes the inessential.

The dialectic is nowhere more apparent than in the art of writing, for the literary object is a peculiar top which exists only in movement. To make it come into view a concrete act called reading is necessary, and it lasts only as long as this act can last. Beyond that, there are only black marks on paper. Now, the writer cannot read what he writes, whereas the shoemaker can put on the shoes he has just made if they are of his size, and the architect can live in the house he has built. In reading, one foresees: one waits. He foresees the end of the sentence, the following sentence, the next page. He waits for them to confirm or disappoint his foresights. The reading is composed of a host of hypotheses, followed by awakenings, of hopes and deceptions. Readers are always ahead of the sentence they are reading in a merely probable future which partly collapses and partly comes together in proportion as they progress, which withdraws from one page to the next and forms the moving horizon of the literary object. Without waiting, without a future, without ignorance, there is no objectivity.

35. The author holds that
    - a. there is an objective reality and a subjective reality.
    - b. nature is the sum total of disparate elements.
    - c. it is human action that reveals the various facets of nature.
    - d. apparently disconnected elements in nature are unified in a fundamental sense.
  
  36. It is the author's contention that
    - a. artistic creations are results of human consciousness.
    - b. the very act of artistic creation leads to the escape of the created object.
    - c. man can produce and reveal at the same time.
    - d. an act of creation forces itself on our consciousness leaving us full of amazement.
  
  37. The passage makes a distinction between perception and creation in terms of
    - a. objectivity and subjectivity.
    - b. revelation and action.
    - c. objective reality and perceived reality.
    - d. essentiality and non-essentiality of objects and subjects.
-

38. The art of writing manifests the dialectic of perception and creation because
- reading reveals the writing till the act of reading lasts.
  - writing to be meaningful needs the concrete act of reading.
  - this art is anticipated and progresses on a series of hypotheses.
  - this literary object has a moving horizon brought about by the very act of creation.
39. A writer, as an artist,
- reveals the essentiality of revelation.
  - makes us feel essential vis-à-vis nature.
  - creates reality.
  - reveals nature in its permanence.

### Passage – 4

Since Second World War, the nation state has been regarded with approval by every political system and every ideology. In the name of modernization in the West, of socialism in the Eastern Bloc, and of the development in the Third World, it was expected to guarantee the happiness of individuals as citizens and of people as societies. However, the state today appears to have broken down in many parts of the world. It has failed to guarantee either security or social justice, and has been unable to prevent either international wars or civil wars. Distributed by the claims of communities within it, the nation state tries to repress their demands and to proclaim itself as the only guarantor of security of all. In the name of national unity, territorial integrity, equality of all its citizens and non-partisan secularism, the state can use its powerful resources to reject the demands of the communities; it may even go so far as genocide to ensure that order prevails.

As one observes the awakening of communities in different parts of the world, one cannot ignore the context in which identity issues arise. It is no longer a context of sealed frontiers and isolated regions but is one of the integrated global systems. In a reaction to this trend towards globalization, individuals and communities everywhere are voicing their desire to exist, to use their power of creation and to play an active part in national and international life.

There are two ways in which the current upsurge in demands for the recognition of identities can be looked at. On the positive side, the efforts by certain population groups to assert their identity can be regarded as 'liberation movements', challenging oppression and injustice. What these groups are doing — proclaiming that they are different, rediscovering the roots of their culture or strengthening group solidarity — may accordingly be seen as legitimate attempts to escape from their state of subjugation and enjoy a certain measure of dignity. On the downside, however, militant action for recognition tends to make such groups more deeply entrenched in their attitude and to make their cultural compartments even more watertight. The assertion of identity then starts turning into self-absorption and isolation, and is liable to slide into intolerance of others and towards ideas of 'ethnic cleansing', xenophobia and violence.

Whereas continuous variations among people prevent drawing of clear dividing lines between the groups, those militating for recognition of their group's identity arbitrarily choose a limited number of criteria such as religion, language, skin colour, and place of origin so that their members recognize themselves primarily in terms of the labels attached to the group whose existence is being asserted. This distinction between

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the group in question and other groups is established by simplifying the feature selected. Simplification also works by transforming groups into essences, abstractions endowed with the capacity to remain unchanged through time. In some cases, people actually act as though the group has remained unchanged and talk, for example, about the history of nations and communities as if these entities survived for centuries without changing, with the same ways of acting and thinking, the same desires, anxieties, and aspirations.

Paradoxically, precisely because identity represents a simplifying fiction, creating uniform groups out of disparate people, that identity performs a cognitive function. It enables us to put names to ourselves and others, form some idea of who we are and who others are, and ascertain the place we occupy along with the others in the world and society. The current upsurge to assert the identity of groups can thus be partly explained by the cognitive function performed by identity. However, that said, people would not go along as they do, often in large numbers, with the propositions put to them, in spite of the sacrifices they entail, if there was not a very strong feeling of need for identity, a need to take stock of things and know 'who we are', 'where we come from' and 'where we are going'.

Identity is thus a necessity in a constantly changing world, but it can also be a potent source of violence and disruption. How can these two contradictory aspects of identity be reconciled? First, we must bear the arbitrary nature of identity categories in mind, not with a view to eliminating all forms of identification — which would be unrealistic since identity is a cognitive necessity — but simply to remind ourselves that each of us has several identities at the same time. Second, since tears of nostalgia are being shed over the past, we recognize that culture is constantly being recreated by cobbling together fresh and original elements and counter-cultures. There are in our own country a large number of syncretic cults wherein modern elements are blended with traditional values or people of different communities venerate saints or divinities of particular faiths. Such cults and movements are characterized by a continual inflow and outflow of members which prevent them from taking on a self-perpetuating existence of their own and hold our hope for the future, indeed, perhaps for the only possible future. Finally, the nation state must respond to the identity urges of its constituent communities and to their legitimate quest for security and social justice. It must do so by inventing what the French philosopher and sociologist, Raymond Aron, called 'peace through law'. That would guarantee justice both to the state as a whole and its parts, and respect the claims of both reason and emotions. The problem is one of reconciling nationalist demands with exercise of democracy.

40. According to the author, happiness of individuals was expected to be guaranteed in the name of
- |                                    |                                       |
|------------------------------------|---------------------------------------|
| a. development in the Third World. | b. socialism in the Third World.      |
| c. development in the West.        | d. modernization in the Eastern Bloc. |
41. Demands for recognition of identities can be viewed
- positively and negatively.
  - as liberation movements and militant action.
  - as efforts to rediscover cultural roots which can slide towards intolerance of others.
  - All of the above
-

42. Going by the author's exposition of the nature of identity, which of the following statements is untrue?
- Identity represents creating uniform groups out of disparate people.
  - Identity is a necessity in the changing world.
  - Identity is a cognitive necessity.
  - None of the above
43. According to the author, the nation state
- has fulfilled its potential.
  - is willing to do anything to preserve order.
  - generates security for all its citizens.
  - has been a major force in preventing civil and international wars.
44. Which of the following views of the nation state cannot be attributed to the author?
- It has not guaranteed peace and security.
  - It may go as far as genocide for self-preservation.
  - It represents the demands of communities within it.
  - It is unable to prevent international wars.

### Passage – 5

The persistent patterns in the way nations fight reflect their cultural and historical traditions and deeply-rooted attitudes that collectively make up their strategic culture. These patterns provide insights that go beyond what can be learnt just by comparing armaments and divisions. In the Vietnam War, the strategic tradition of the United States called for forcing the enemy to fight a massed battle in an open area, where superior American weapons would prevail. The United States was trying to re-fight Second World War in the jungles of South-east Asia, against an enemy with no intention of doing so.

Some British historians describe the Asian way of war as one of indirect attacks, avoiding frontal attacks meant to overpower an opponent. This traces back to Asian history and geography: the great distances and harsh terrain have often made it difficult to execute the sort of open field clashes allowed by the flat terrain and relatively compact size of Europe. A very different strategic tradition arose in Asia.

The bow and arrow were metaphors for an Eastern way of war. By its nature, the arrow is an indirect weapon. Fired from a distance of hundreds of yards, it does not necessitate immediate physical contact with the enemy. Thus, it can be fired from hidden positions. When fired from behind a ridge, the barrage seems to come out of nowhere, taking the enemy by surprise. The tradition of this kind of fighting is captured in the classical strategic writing of the East. The 2,000 years worth of Chinese writings on war constitutes the most subtle writing on the subject in any language. Not until Clausewitz, did the West produce a strategic theorist to match the sophistication of Sun-tzu, whose *Art of War* was written 2,300 years earlier.

In Sun-tzu and other Chinese writings, the highest achievement of arms is to defeat an adversary without fighting. He wrote: "To win one hundred victories in one hundred battles is not the acme of skill. To subdue

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the enemy without fighting is the supreme excellence.” Actual combat is just one among many means towards the goal of subduing an adversary. War contains too many surprises to be a first resort. It can lead to ruinous losses, as has been seen time and again. It can have the unwanted effect of inspiring heroic efforts in an enemy, as the United States learned in Vietnam, and as the Japanese found out after Pearl Harbour.

Aware of the uncertainties of a military campaign, Sun-tzu advocated war only after the most thorough preparations. Even then, it should be quick and clean. Ideally, the army is just an instrument to deal the final blow to an enemy already weakened by isolation, poor morale, and disunity. Ever since Sun-tzu, the Chinese have been seen as masters of subtlety who take measured actions to manipulate an adversary without his knowledge. The dividing line between war and peace can be obscure. Low level violence often is the backdrop to a larger strategic campaign. The unwitting victim, focused on the day-to-day events, never realizes what’s happening to him until it’s too late. History holds many examples. The Viet Cong lured French and US infantry deep into the jungle, weakening their morale over several years. The mobile army of the United States was designed to fight on the plains of Europe, where it could quickly move unhindered from one spot to the next. The jungle did more than make quick movement impossible; broken down into smaller units and scattered in isolated bases, US forces were deprived of the feeling of support and protection that ordinarily comes from being part of a big army.

The isolation of US troops in Vietnam was not just a logistical detail, something that could be overcome by, for instance, bringing in reinforcements by helicopter. In a big army reinforcements are readily available. It was Napoleon who realized the extraordinary effects on morale that come from being part of a larger formation. Just the knowledge of it lowers the soldier’s fear and increases his aggressiveness. In the jungle and on isolated bases, this feeling was removed. The thick vegetation slowed down the reinforcements and made it difficult to find stranded units. Soldiers felt they were on their own.

More important, by altering the way the war was fought, the Viet Cong stripped the United States of its belief in the inevitability of victory, as it had done to the French before them. Morale was high when these armies first went to Vietnam. Only after many years of debilitating and demoralizing fighting did Hanoi launch its decisive attacks, at Dien Bien Phu in 1954 and against Saigon in 1975. It should be recalled that in the final push to victory the North Vietnamese abandoned their jungle guerrilla tactics completely, committing their entire army of twenty divisions to pushing the South Vietnamese into collapse. This final battle, with the enemy’s army all in one place, was the one that the United States had desperately wanted to fight in 1965. When it did come out into the open in 1975, Washington had already withdrawn its forces and there was no possibility of re-intervention.

The Japanese early in Second World War used a modern form of the indirect attack, one that relied on stealth and surprise for its effects. At Pearl Harbour, in the Philippines, and in South-east Asia, stealth and surprise were attained by sailing under radio silence so that the navy’s movements could not be tracked. Moving troops aboard ships into South-east Asia made it appear that the Japanese army was also ‘invisible’. Attacks against Hawaii and Singapore seemed, to the American and British defenders, to come from nowhere. In Indonesia and the Philippines the Japanese attack was even faster than the German blitz against France in the West.

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The greatest military surprises in American history have all been in Asia. Surely, there is something going on here beyond the purely technical difficulties of detecting enemy movements. Pearl Harbour, the Chinese intervention in Korea, and the Tet offensive in Vietnam all came out of a tradition of surprise and stealth. US technical intelligence — the location of enemy units and their movements — was greatly improved after each surprise, but with no noticeable improvement in the American ability to foresee or prepare what would happen next. There is a cultural divide here, not just a technical one. Even when it was possible to track an army with intelligence satellites, as when Iraq invaded Kuwait or when Syria and Egypt attacked Israel, surprise was achieved. The United States was stunned by Iraq's attack on Kuwait even though it had satellite pictures of Iraqi troops massing at the border.

The exception that proves the point that cultural differences obscure the West's understanding of Asian behaviour was the Soviet Union's 1979 invasion of Afghanistan. This was fully anticipated and understood in advance. There was no surprise because the United States understood Moscow's world view and thinking. It could anticipate Soviet action almost as well as the Soviets themselves, because the Soviet Union was really a western country.

The difference between the eastern and the western way of war is striking. The West's great strategic writer, Clausewitz, linked war to politics, as did Sun-tzu. Both were opponents of militarism, of turning war over to the generals. But there, all similarity ends. Clausewitz wrote that the way to achieve a larger political purpose is through destruction of the enemy's army. After observing Napoleon conquer Europe by smashing enemy armies to bits, Clausewitz made his famous remark in *On War* (1932) that combat is the continuation of politics by violent means. Morale and unity are important, but they should be harnessed for the ultimate battle. If the eastern way of war is embodied by the stealthy archer, the metaphorical western counterpart is the swordsman charging forward, seeking a decisive showdown, eager to administer the blow that will obliterate the enemy once and for all. In this view, war proceeds along a fixed course and occupies a finite extent of time, like a play in three acts with a beginning, a middle, and an end. The end, the final scene, decides the issue for good.

When things don't work out quite this way, the western military mind feels tremendous frustration. Sun-tzu's great disciples, Mao Zedong and Ho Chi Minh, are respected in Asia for their clever use of indirection and deception to achieve an advantage over stronger adversaries. But in the West their approach is seen as underhanded and devious. To the American strategic mind, the Viet Cong guerilla did not fight fairly. They should have come out into the open and fought like men, instead of hiding in the jungle and sneaking around like a cat in the night.

45. According to the author, the main reason for the US losing the Vietnam War was
    - a. the Vietnamese understood the local terrain better.
    - b. the lack of support for the war from the American people.
    - c. the failure of the US to mobilize its military strength.
    - d. their inability to fight a war on terms other than those they understood well.
  
  46. Which of the following statements does not describe the 'Asian' way of war?
    - a. Indirect attacks without frontal attacks.
    - b. The swordsman charging forward to obliterate the enemy once and for all.
    - c. Manipulation of an adversary without his knowledge.
    - d. Subduing an enemy without fighting.
-

47. Which of the following is not one of Sun-tzu's ideas?
- Actual combat is the principal means of subduing an adversary.
  - War should be undertaken only after thorough preparation.
  - War is linked to politics.
  - War should not be left to the generals alone.
48. The difference in the concepts of war of Clausewitz and Sun-tzu is best characterized by
- Clausewitz's support for militarism as against Sun-tzu's opposition to it.
  - their relative degrees of sophistication.
  - their attitude to guerilla warfare.
  - their differing conceptions of the structure, time and sequence of a war.
49. To the Americans, the approach of the Viet Cong seemed devious because
- the Viet Cong did not fight like men out in the open.
  - the Viet Cong allied with America's enemies.
  - the Viet Cong took strategic advice from Mao Zedong.
  - the Viet Cong used bows and arrows rather than conventional weapons.
50. According to the author, the greatest military surprises in American history have been in Asia because
- the Americans failed to implement their military strategies many miles away from their own country.
  - the Americans were unable to use their technologies like intelligence satellites effectively to detect enemy movements.
  - the Americans failed to understand the Asian culture of war that was based on stealth and surprise.
  - Clausewitz is inferior to Sun-tzu.

**Directions for questions 51 to 55:** Arrange the sentences A, B, C and D to form a logical sequence between sentences 1 and 6.

51. 1. Making people laugh is tricky.
- At times, the intended humour may simply not come off.
  - Making people laugh while trying to sell them something is a tougher challenge, since the commercial can fall flat on two grounds.
  - There are many advertisements which do amuse but do not even begin to set the cash registers ringing.
  - Again, it is rarely sufficient for an advertiser simply to amuse the target audience in order to reap the sales benefit.
6. There are indications that in substituting the hardsell for a more entertaining approach, some agencies have rather thrown out the baby with the bath-water.
- a. CDBA                      b. ABCD                      c. BADC                      d. DCBA
52. 1. Picture a termite colony, occupying a tall mud hump on an African plain.
- Hungry predators often invade the colony and unsettle the balance.
  - The colony flourishes only if the proportion of soldiers to workers remains roughly the same, so that the queen and workers can be protected by the soldiers, and the queen and soldiers can be serviced by the workers.
-

- C. But its fortunes are presently restored, because the immobile queen, walled in well below the ground level, lays eggs not only in large enough numbers, but also in the varying proportions required.
- D. The hump is alive with worker termites and soldier termites going about their distinct kinds of business.
6. How can we account for a mysterious ability to respond like this to events on the distant surface?  
 a. BADC                      b. DBAC                      c. ADCB                      d. BDCA
53. 1. According to recent research, the critical period for developing language skills is between the age of three and five years.
- A. The read-to child already has a large vocabulary and a sense of grammar and sentence structure.
- B. Children who are read to in these years have a far better chance of reading well in school, indeed, of doing well in all their subjects.
- C. And the reason is actually quite simple.
- D. This correlation is far and away the highest yet found between home influences and school success.
6. Their comprehension of language is therefore very high.  
 a. DACD                      b. ADCB                      c. ABCD                      d. BDCA
54. 1. High-powered outboard motors were considered to be one of the major threats to the survival of the Beluga whales.
- A. With these, hunters could approach Belugas within hunting range and profit from its inner skin and blubber.
- B. To escape an approaching motor, Belugas have learnt to dive to the ocean bottom and stay there for up to 20 min, by which time the confused predator has left.
- C. Today, however, even with much more powerful engines, it is difficult to come close, because the whales seem to disappear suddenly just when you thought you had them in your sights.
- D. When the first outboard engines arrived in the early 1930s, one came across 4 HP and 8 HP motors.
6. Belugas seem to have used their well-known sensitivity to noise to evolve an 'avoidance' strategy to outsmart hunters and their powerful technologies.  
 a. DACB                      b. ACDB                      c. ADCB                      d. DBAC
55. 1. The reconstruction of history by post-revolutionary science texts involves more than a multiplication of historical misconstructions.
- A. Because they aim quickly to acquaint the student with what the contemporary scientific community thinks it knows, textbooks treat the various experiments, concepts, laws and theories of the current normal science as separately and as nearly seriatim as possible.
- B. Those misconstructions render revolutions invisible; the arrangement of the still visible material in science texts implies a process that, if it existed, would deny revolutions a function.
- C. But when combined with the generally unhistorical air of science writing and with the occasional systematic misconception, one impression is likely to follow.
- D. As pedagogy, this technique of presentation is unexceptionable.
6. Science has reached its present state by a series of individual discoveries and inventions that, when gathered together, constitute the modern body of technical knowledge.  
 a. BADC                      b. ADCB                      c. DACB                      d. CBDA
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## Section – II

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**Directions for questions 56 to 74:** Answer each of the questions independently.

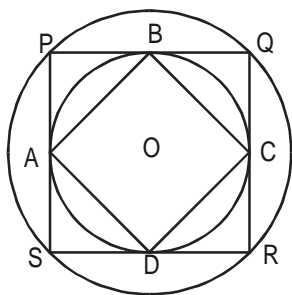
56. The number of positive integer valued pairs  $(x, y)$  satisfying  $4x - 17y = 1$  and  $x \leq 1000$  is  
a. 59                                  b. 57                                  c. 55                                  d. 58
57. Let  $a, b, c$  be distinct digits. Consider a two-digit number 'ab' and a three-digit number 'ccb', both defined under the usual decimal number system, if  $(ab)^2 = ccb > 300$ , then the value of  $b$  is  
a. 1                                  b. 0                                  c. 5                                  d. 6
58. The remainder when  $7^{84}$  is divided by 342 is  
a. 0                                  b. 1                                  c. 49                                  d. 341
59. Ten points are marked on a straight-line and 11 points are marked on another straight-line. How many triangles can be constructed with vertices from among the above points?  
a. 495                                  b. 550                                  c. 1045                                  d. 2475
60. For a scholarship, at the most  $n$  candidates out of  $2n + 1$  can be selected. If the number of different ways of selection of at least one candidate is 63, the maximum number of candidates that can be selected for the scholarship is  
a. 3                                  b. 4                                  c. 6                                  d. 5
61. The speed of a railway engine is 42 kmph when no compartment is attached, and the reduction in speed is directly proportional to the square root of the number of compartments attached. If the speed of the train carried by this engine is 24 kmph when 9 compartments are attached, the maximum number of compartments that can be carried by the engine is  
a. 49                                  b. 48                                  c. 46                                  d. 47
62. Total expenses of a boarding house are partly fixed and partly varying linearly with the number of boarders. The average expense per boarder is Rs. 700 when there are 25 boarders and Rs. 600 when there are 50 boarders. What is the average expense per boarder when there are 100 boarders?  
a. 550                                  b. 580                                  c. 540                                  d. 570
63. Forty per cent of the employees of a certain company are men, and 75% of the men earn more than Rs. 25,000 per year. If 45% of the company's employees earn more than Rs. 25,000 per year, what fraction of the women employed by the company earn less than or equal to Rs. 25,000 per year?  
a.  $\frac{2}{11}$                                   b.  $\frac{1}{4}$                                   c.  $\frac{1}{3}$                                   d.  $\frac{3}{4}$
64. If  $|r - 6| = 11$  and  $|2q - 12| = 8$ , what is the minimum possible value of  $\frac{q}{r}$ ?  
a.  $-\frac{2}{5}$                                   b.  $\frac{2}{17}$                                   c.  $\frac{10}{17}$                                   d. None of these
-

65. If  $n = 1 + x$  where  $x$  is the product of four consecutive positive integers, then which of the following is/are true?  
 A.  $n$  is odd  
 B.  $n$  is prime  
 C.  $n$  is a perfect square  
 a. A and C only                      b. A and B only                      c. A only                      d. None of these

66. In a survey of political preferences, 78% of those asked were in favour of at least one of the proposals: I, II and III. 50% of those asked favoured proposal I, 30% favoured proposal II and 20% favoured proposal III. If 5% of those asked favoured all three of the proposals, what percentage of those asked favoured more than one of the three proposals?  
 a. 10                      b. 12                      c. 17                      d. 22

67. For two positive integers  $a$  and  $b$  define the function  $h(a,b)$  as the greatest common factor (G.C.F) of  $a$ ,  $b$ . Let  $A$  be a set of  $n$  positive integers.  $G(A)$ , the G.C.F of the elements of set  $A$  is computed by repeatedly using the function  $h$ . The minimum number of times  $h$  is required to be used to compute  $G$  is  
 a.  $\frac{1}{2}n$                       b.  $(n - 1)$                       c.  $n$                       d. None of these

68. The figure below shows two concentric circles with centre  $O$ . PQRS is a square inscribed in the outer circle. It also circumscribes the inner circle, touching it at points  $B$ ,  $C$ ,  $D$  and  $A$ . What is the ratio of the perimeter of the outer circle to that of polygon ABCD?



- a.  $\frac{\pi}{4}$                       b.  $\frac{3\pi}{2}$                       c.  $\frac{\pi}{2}$                       d.  $\pi$
69. Three labelled boxes containing red and white cricket balls are all mislabelled. It is known that one of the boxes contains only white balls and another one contains only red balls. The third contains a mixture of red and white balls. You are required to correctly label the boxes with the labels red, white and red and white by picking a sample of one ball from only one box. What is the label on the box you should sample?  
 a. white  
 b. red  
 c. red and white  
 d. Not possible to determine from a sample of one ball

70. If  $n^2 = 12345678987654321$ , what is  $n$ ?
- a. 12344321                      b. 1235789                      c. 111111111                      d. 1111111
71. Abraham, Border, Charlie, Dennis and Elmer, and their respective wives recently dined together and were seated at a circular table. The seats were so arranged that men and women alternated and each woman was three places away from her husband. Mrs Charlie sat to the left of Mr Abraham. Mrs Elmer sat two places to the right of Mrs Border. Who sat to the right of Mr Abraham?
- a. Mrs Dennis    b. Mrs Elmer  
c. Mrs Border    d. Mrs Border or Mrs Dennis
72. Navjivan Express from Ahmedabad to Chennai leaves Ahmedabad at 6.30 a.m. and travels at 50 kmph towards Baroda situated 100 km away. At 7.00 a.m. Howrah-Ahmedabad Express leaves Baroda towards Ahmedabad and travels at 40 kmph. At 7.30 a.m. Mr Shah, the traffic controller at Baroda realizes that both the trains are running on the same track. How much time does he have to avert a head-on collision between the two trains?
- a. 15 min                      b. 20 min                      c. 25 min                      d. 30 min
73. There is a circle of radius 1 cm. Each member of a sequence of regular polygons  $S1(n)$ ,  $n = 4, 5, 6, \dots$ , where  $n$  is the number of sides of the polygon, is circumscribing the circle: and each member of the sequence of regular polygons  $S2(n)$ ,  $n = 4, 5, 6, \dots$  where  $n$  is the number of sides of the polygon, is inscribed in the circle. Let  $L1(n)$  and  $L2(n)$  denote the perimeters of the corresponding polygons of  $S1(n)$  and  $S2(n)$ , then  $\frac{\{L1(13) + 2\pi\}}{L2(17)}$  is
- a. greater than  $\frac{\pi}{4}$  and less than 1                      b. greater than 1 and less than 2  
c. greater than 2    d. less than  $\frac{\pi}{4}$
74. There is a square field of side 500 m long each. It has a compound wall along its perimeter. At one of its corners, a triangular area of the field is to be cordoned off by erecting a straight-line fence. The compound wall and the fence will form its borders. If the length of the fence is 100 m, what is the maximum area that can be cordoned off?
- a. 2,500 sq m                      b. 10,000 sq m                      c. 5,000 sq m                      d. 20,000 sq m

**Directions for questions 75 to 77:** Answer the questions based on the following information.

Ten coins are distributed among four people P, Q, R and S such that one of them gets one coin, another gets two coins, the third gets three coins and the fourth gets four coins. It is known that Q gets more coins than P, and S gets fewer coins than R.

75. If the number of coins distributed to Q is twice the number distributed to P, then which one of the following is necessarily true?
- a. R gets an even number of coins.                      b. R gets an odd number of coins.  
c. S gets an even number of coins.                      d. S gets an odd number of coins.
-

76. If R gets at least two more coins than S, then which one of the following is necessarily true?  
 a. Q gets at least two more coins than S.      b. Q gets more coins than S.  
 c. P gets more coins than S.      d. P and Q together get at least five coins.
77. If Q gets fewer coins than R, then which one of the following is not necessarily true?  
 a. P and Q together get at least four coins.      b. Q and S together get at least four coins.  
 c. R and S together get at least five coins.      d. P and R together get at least five coins.

**Directions for questions 78 to 80:** Answer the questions based on the following information.

A young girl Roopa leaves home with  $x$  flowers, goes to the bank of a nearby river. On the bank of the river, there are four places of worship, standing in a row. She dips all the  $x$  flowers into the river. The number of flowers doubles. Then she enters the first place of worship, offers  $y$  flowers to the deity. She dips the remaining flowers into the river, and again the number of flowers doubles. She goes to the second place of worship, offers  $y$  flowers to the deity. She dips the remaining flowers into the river, and again the number of flowers doubles. She goes to the third place of worship, offers  $y$  flowers to the deity. She dips the remaining flowers into the river, and again the number of flowers doubles. She goes to the fourth place of worship, offers  $y$  flowers to the deity. Now she is left with no flowers in hand.

78. If Roopa leaves home with 30 flowers, the number of flowers she offers to each deity is  
 a. 30      b. 31      c. 32      d. 33
79. The minimum number of flowers that could be offered to each deity is  
 a. 0      b. 15      c. 16      d. Cannot be determined
80. The minimum number of flowers with which Roopa leaves home is  
 a. 16      b. 15      c. 0      d. Cannot be determined

**Directions for questions 81 and 82:** Answer the questions based on the following information.

The following table presents the sweetness of different items relative to sucrose, whose sweetness is taken to be 1.00.

Lactose	0.16
Maltose	0.32
Glucose	0.74
Sucrose	1.00
Fructose	1.70
Saccharin	675.00

81. What is the minimum amount of sucrose (to the nearest gram) that must be added to one gram of saccharin to make a mixture that will be at least 100 times as sweet as glucose?  
 a. 7      b. 8      c. 9      d. 100

82. Approximately how many times sweeter than sucrose is a mixture consisting of glucose, sucrose and fructose in the ratio of 1 : 2 : 3?
- a. 1.3                      b. 1.0                      c. 0.6                      d. 2.3

**Directions for questions 83 and 84:** Answer the questions based on the following information.

A, B, C, D, E and F are a group of friends from a club. There are two housewives, one lecturer, one architect, one accountant and one lawyer in the group. There are two married couples in the group. The lawyer is married to D who is a housewife. No lady in the group is either an architect or an accountant. C, the accountant, is married to F who is a lecturer. A is married to D and E is not a housewife.

83. What is the profession of E?
- a. Lawyer                      b. Architect                      c. Lecturer                      d. Accountant
84. How many members of the group are male?
- a. 2                      b. 3                      c. 4                      d. None of these

**Direction for questions 85 and 86:** Answer the questions based on the following information.

Seven university cricket players are to be honoured at a special luncheon. The players will be seated on the dais along one side of a single rectangular table.

- I. A and G have to leave the luncheon early and must be seated at the extreme right end of the table, which is closest to the exit.
- II. B will receive the Man of the Match Award and must be in the centre chair.
- III. C and D who are bitter rivals for the position of wicketkeeper, dislike one another and should be seated as far apart as possible.
- IV. E and F are best friends and want to sit together.

85. Which of the following may not be seated at either end of the table?
- a. C                      b. D                      c. G                      d. F
86. Which of the following pairs may not be seated together?
- a. E and A                      b. B and D                      c. C and F                      d. G and D

**Directions for questions 87 and 88:** Answer the questions based on the following information.

A rectangle PRSU, is divided into two smaller rectangles PQTU, and QRST by the line TQ. PQ = 10 cm. QR = 5 cm and RS = 10 cm. Points A, B, F are within rectangle PQTU, and points C, D, E are within the rectangle QRST. The closest pair of points among the pairs (A, C), (A, D), (A, E), (F, C), (F, D), (F, E), (B, C), (B, D), (B, E) are  $10\sqrt{3}$  cm apart.

87. Which of the following statements is necessarily true?
- a. The closest pair of points among the six given points cannot be (F, C)
  - b. Distance between A and B is greater than that between F and C.
  - c. The closest pair of points among the six given points is (C, D), (D, E), or (C, E).
  - d. None of the above
-



88.  $AB > AF > BF$  ;  $CD > DE > CE$  ; and  $BF = 6\sqrt{5}$  cm. Which is the closest pair of points among all the six given points?

- a. B, F                      b. C, D                      c. A, B                      d. None of these

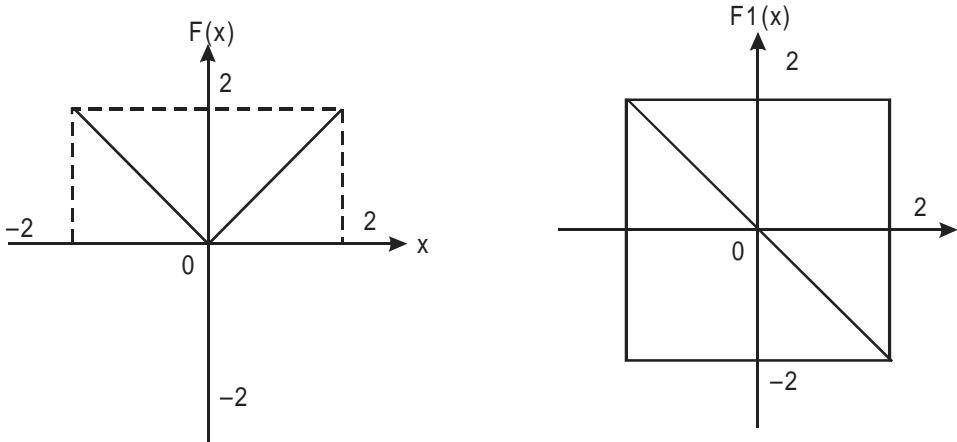
**Directions for questions 89 to 92:** Answer the questions based on the following information.

In each of the following questions, a pair of graphs  $F(x)$  and  $F_1(x)$  is given. These are composed of straight-line segments, shown as solid lines, in the domain  $x \in (-2, 2)$ .

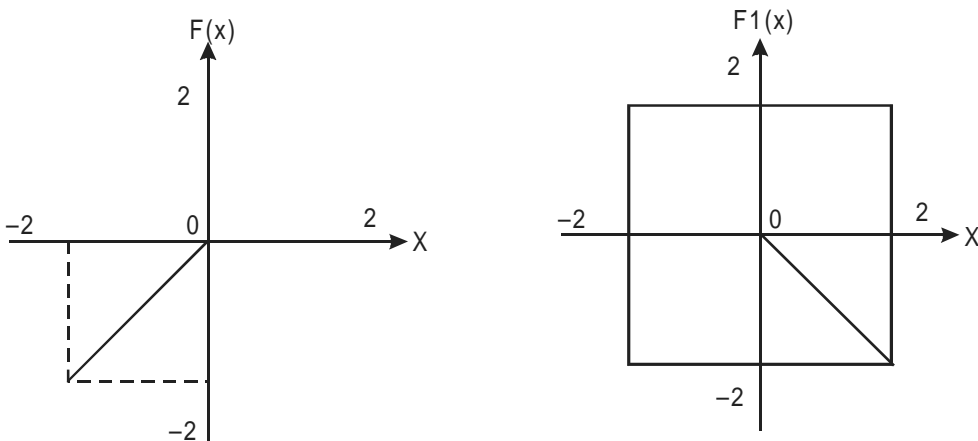
**Choose the answer as**

- a. if  $F_1(x) = -F(x)$   
 b. if  $F_1(x) = F(-x)$   
 c. if  $F_1(x) = -F(-x)$   
 d. if none of the above is true

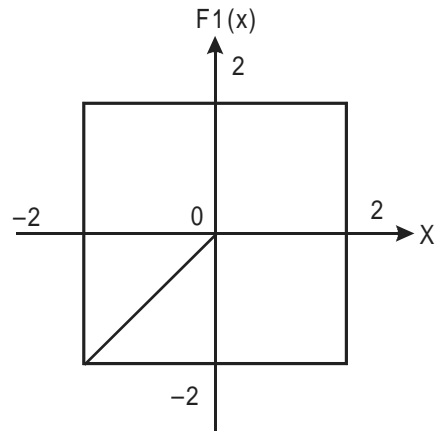
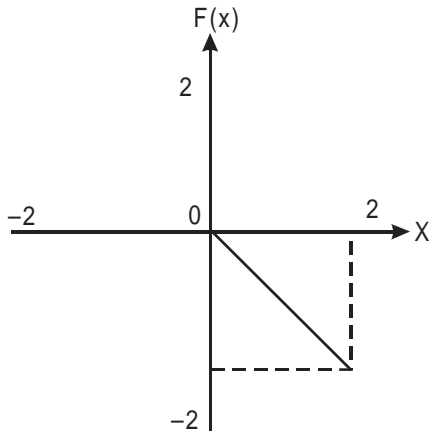
89.



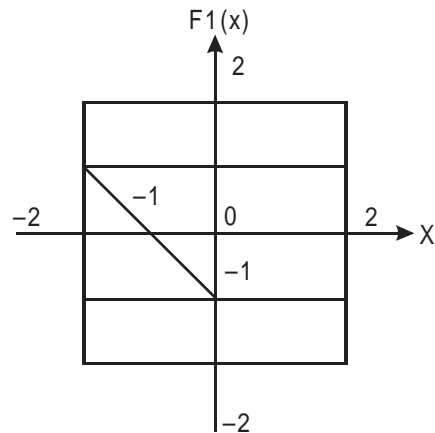
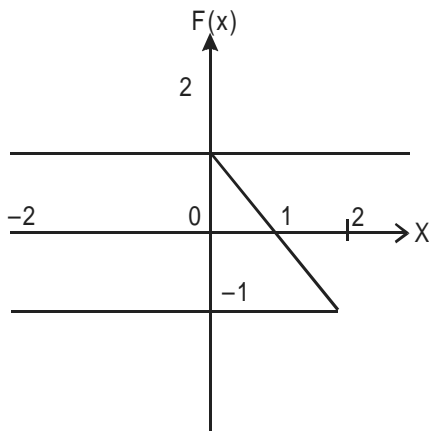
90.



91.



92.



**Directions for questions 93 and 94:** Answer the questions based on the following information.

There are blue vessels with known volumes  $v_1, v_2, \dots, v_m$ , arranged in ascending order of volume,  $v_1 > 0.5$  litre, and  $v_m < 1$  litre. Each of these is full of water initially. The water from each of these is emptied into a minimum number of empty white vessels, each having volume 1 litre. The water from a blue vessel is not emptied into a white vessel unless the white vessel has enough empty volume to hold all the water of the blue vessel. The number of white vessels required to empty all the blue vessels according to the above rules was  $n$ .

93. Among the four values given below, which is the least upper bound on  $e$ , where  $e$  is the total empty volume in the white vessels at the end of the above process?

a.  $mv_m$

b.  $m(1 - v_m)$

c.  $mv_1$

d.  $m(1 - v_1)$

94. Let the number of white vessels needed be  $n_1$  for the emptying process described above, if the volume of each white vessel is 2 litres. Among the following values, which is the least upper bound on  $n_1$ ?
- $\frac{m}{4}$
  - Smallest integer greater than or equal to  $\left(\frac{n}{2}\right)$
  - $n$
  - Greatest integer less than or equal to  $\left(\frac{n}{2}\right)$

**Directions for questions 95 to 97:** Answer the questions based on the following information.

There are 50 integers  $a_1, a_2 \dots a_{50}$ , not all of them necessarily different. Let the greatest integer of these 50 integers be referred to as  $G$ , and the smallest integer be referred to as  $L$ . The integers  $a_1$  through  $a_{24}$  form sequence  $S_1$ , and the rest form sequence  $S_2$ . Each member of  $S_1$  is less than or equal to each member of  $S_2$ .

95. All values in  $S_1$  are changed in sign, while those in  $S_2$  remain unchanged. Which of the following statements is true?
- Every member of  $S_1$  is greater than or equal to every member of  $S_2$ .
  - $G$  is in  $S_1$ .
  - If all numbers originally in  $S_1$  and  $S_2$  had the same sign, then after the change of sign, the largest number of  $S_1$  and  $S_2$  is in  $S_1$ .
  - None of the above
96. Elements of  $S_1$  are in ascending order, and those of  $S_2$  are in descending order.  $a_{24}$  and  $a_{25}$  are interchanged. Then which of the following statements is true?
- $S_1$  continues to be in ascending order.
  - $S_2$  continues to be in descending order.
  - $S_1$  continues to be in ascending order and  $S_2$  in descending order.
  - None of the above
97. Every element of  $S_1$  is made greater than or equal to every element of  $S_2$  by adding to each element of  $S_1$  an integer  $x$ . Then  $x$  cannot be less than
- $2^{10}$
  - the smallest value of  $S_2$
  - the largest value of  $S_2$
  - $(G - L)$

**Directions for questions 98 to 100:** Answer the questions based on the following information.

Let  $x$  and  $y$  be real numbers and let

$$f(x, y) = |x + y|, F(f(x, y)) = -f(x, y)$$

$$\text{and } G(f(x, y)) = -F(f(x, y))$$

98. Which of the following statements is true?
- $F(f(x, y)) \cdot G(f(x, y)) = -F(f(x, y)) \cdot G(f(x, y))$
  - $F(f(x, y)) \cdot G(f(x, y)) > -F(f(x, y)) \cdot G(f(x, y))$
  - $F(f(x, y)) \cdot G(f(x, y)) \neq G(f(x, y)) \cdot G(f(x, y))$
  - $F(f(x, y)) + G(f(x, y)) + f(x, y) = f(-x, -y)$
99. What is the value of  $f(G(f(1, 0)), f(F(f(1, 2)), G(f(1, 2))))$ ?
- 3
  - 2
  - 1
  - 0
100. Which of the following expressions yields  $x^2$  as its result?
- $F(f(x, -x)) \cdot G(f(x, -x))$
  - $F(f(x, x)) \cdot G(f(x, x)) \cdot 4$
  - $-F(f(x, x)) \cdot G(f(x, x)) \div \log_2 16$
  - $f(x, x) \cdot f(x, x)$

**Directions for questions 101 and 102:** Answer the questions based on the following information.

A robot moves on a graph sheet with X and Y-axis. The robot is moved by feeding it with a sequence of instructions. The different instructions that can be used in moving it, and their meanings are:

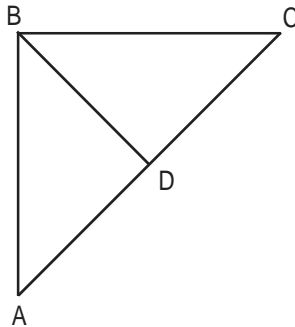
Instruction	Meaning
GOTO (x,y)	Move to point with coordinates (x, y) no matter where you are currently
WALKX(p)	Move parallel to the X-axis through a distance of p, in the positive direction if p is positive, and in the negative direction if p is negative
WALKY(p)	Move parallel to the Y-axis through a distance of p, in the positive direction if p is positive, and in the negative direction if p is negative.

101. The robot reaches point (6, 6) when a sequence of three instructions is executed, the first of which is a GOTO(x,y) instruction, the second is WALKX(2) and the third is WALKY(4). What are the value of  $x$  and  $y$ ?
- 2, 4
  - 0, 0
  - 4, 2
  - 2, 2
102. The robot is initially at (x, y),  $x > 0$  and  $y < 0$ . The minimum number of instructions needed to be executed to bring it to the origin (0, 0) if you are prohibited from using the GOTO instruction is
- 2
  - 1
  - $x + y$
  - 0

**Directions for questions 103 to 105:** Answer the questions based on the following information.

A road network (shown in the figure below) connects cities A, B, C and D. All road segments are straight lines. D is the mid-point on the road connecting A and C. Roads AB and BC are at right angles to each other with BC shorter than AB. The segment AB is 100 km long.

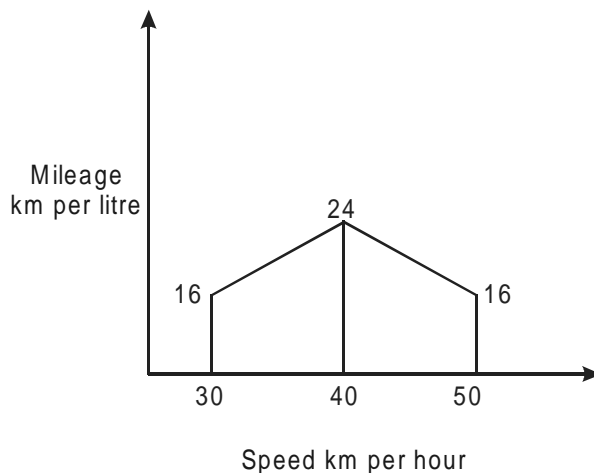
Ms X and Mr Y leave A at 8.00 a.m., take different routes to city C and reach at the same time. X takes the highway from A to B to C and travels at an average speed of 61.875 kmph. Y takes the direct route AC and travels at 45 kmph on segment AD. Y's speed on segment DC is 55 kmph.



103. What is the average speed of Y?  
 a. 47.5 kmph                      b. 49.5 kmph                      c. 50 kmph                      d. 52 kmph
104. The total distance travelled by Y during the journey is approximately  
 a. 105 km                      b. 150 km                      c. 130 km                      d. Cannot be determined
105. What is the length of the road segment BD?  
 a. 50 km                      b. 52.5 km                      c. 55 km                      d. Cannot be determined

**Directions for questions 106 and 107:** Answer the questions based on the following information.

Rajiv reaches city B from city A in 4 hours, driving at speed of 35 kmph for the first two hour and at 45 kmph for the next two hours. Aditi follows the same route, but drives at three different speeds: 30, 40 and 50 kmph, covering an equal distance in each speed segment. The two cars are similar with petrol consumption characteristics (km per litre) shown in the figure below.







116. A. Anteaters like ants.  
 B. Boys are anteaters.  
 C. Balaram is an anteater.  
 D. Balaram likes ants.  
 E. Balaram may eat ants.  
 a. DCA                      b. ADC                      c. ABE                      d. ACD
117. A. All actors are handsome.  
 B. Some actors are popular.  
 C. Ram is handsome.  
 D. Ram is a popular actor.  
 E. Some popular people are handsome.  
 a. ACD                      b. ABE                      c. DCA                      d. EDC
118. A. Modern industry is technology-driven.  
 B. BTI is a modern industry.  
 C. BTI is technology-driven.  
 D. BTI may be technology-driven  
 E. Technology driven industry is modern.  
 a. ABC                      b. ABD                      c. BCA                      d. EBC
119. A. All Golmal islanders are blue-coloured people.  
 B. Some smart people are not blue-coloured people.  
 C. Some babies are blue-coloured.  
 D. Some babies are smart.  
 E. Some smart people are not Golmal islanders.  
 a. BCD                      b. ABE                      c. CBD                      d. None of these
120. A. MBAs are in great demand.  
 B. Ram and Sita are in great demand.  
 C. Ram is in great demand.  
 D. Sita is in great demand.  
 E. Ram and Sita are MBAs.  
 a. ABE                      b. ECD                      c. AEB                      d. EBA

**Directions for questions 121 to 124:** Each question has a main statement followed by four statements labelled A, B, C and D. Choose the ordered pair of statements where the first statement implies the second, and the two statements are logically consistent with the main statement.

121. Either the orangutan is not angry, or he frowns upon the world.  
 A. The orangutan frowns upon the world.  
 B. The orangutan is not angry.  
 C. The orangutan does not frown upon the world.  
 D. The orangutan is angry.  
 a. CB only                      b. DA only                      c. AB only                      d. CB and DA
-



122. Either Ravana is a demon, or he is a hero.  
 A. Ravana is a hero.  
 B. Ravana is a demon.  
 C. Ravana is not a demon.  
 D. Ravana is not a hero.  
 a. CD only                      b. BA only                      c. CD and BA                      d. DB and CA
123. Whenever Rajeev uses the Internet, he dreams about spiders.  
 A. Rajeev did not dream about spiders.  
 B. Rajeev used the Internet.  
 C. Rajeev dreamt about spiders.  
 D. Rajeev did not use the Internet.  
 a. AD                              b. DC                              c. CB                              d. DA
124. If I talk to my professors, then I do not need to take a pill for headache.  
 A. I talked to my professors.  
 B. I did not need to take a pill for headache.  
 C. I needed to take a pill for headache.  
 D. I did not talk to my professors.  
 a. AB only                      b. DC only                      c. CD only                      d. AB and CD

**Directions for questions 125 to 134:** Each question has a set of four statements. Each statement has three segments. Choose the alternative where the third segment in the statement can be logically deduced using both the preceding two, but not just from one of them.

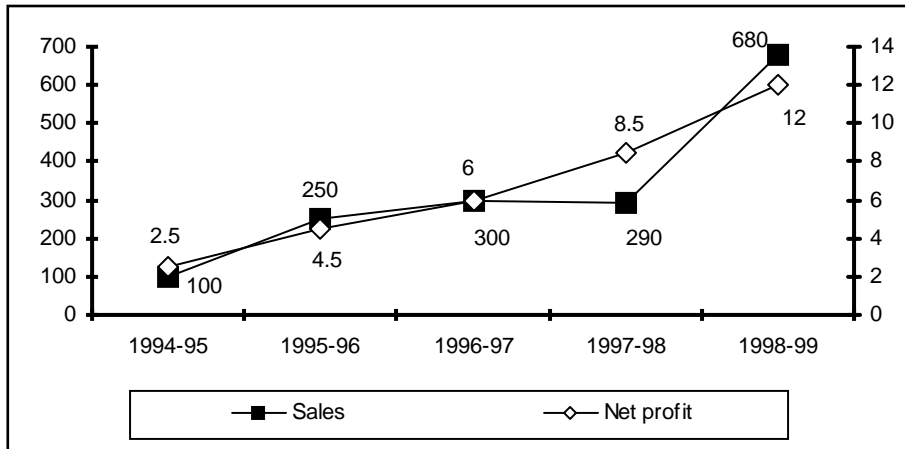
125. A. No cowboys laugh. Some who laugh are sphinxes. Some sphinxes are not cowboys.  
 B. All ghosts are florescent. Some ghost do not sing. Some singers are not florescent.  
 C. Cricketers indulge in swearing. Those who swear are hanged. Some who are hanged are not cricketers.  
 D. Some crazy people are pianists. All crazy people are whistlers. Some whistlers are pianists.  
 a. A and B                      b. C only                      c. A and D                      d. D only
126. A. All good people are knights. All warriors are good people. All knights are warriors.  
 B. No footballers are ministers. All footballers are tough. Some ministers are players.  
 C. All pizzas are snacks. Some meals are pizzas. Some meals are snacks.  
 D. Some barkers are musk deer. All barkers are sloth bears. Some sloth bears are musk deer.  
 a. C and D                      b. B and C                      c. A only                      d. C only
127. A. Dinosaurs are prehistoric creatures. Water-buffaloes are not dinosaurs. Water-buffaloes are not prehistoric creatures.  
 B. All politicians are frank. No frank people are crocodiles. No crocodiles are politicians.  
 C. No diamond is quartz. No opal is quartz. Diamonds are opals.  
 D. All monkeys like bananas. Some GI Joes like bananas. Some GI Joes are monkeys.  
 a. C only                      b. B only                      c. A and D                      d. B and C
-

128. A. All earthquakes cause havoc. Some landslides cause havoc. Some earthquakes cause landslides.  
B. All glass things are transparent. Some curios are glass things. Some curios are transparent.  
C. All clay objects are brittle. All XY are clay objects. Some XY are brittle.  
D. No criminal is a patriot. Ram is not a patriot. Ram is a criminal.  
a. D only                      b. B only                      c. C and B                      d. A only
129. A. MD is an actor. Some actors are pretty. MD is pretty.  
B. Some men are cops. All cops are brave. Some brave people are cops.  
C. All cops are brave. Some men are cops. Some men are brave.  
D. All actors are pretty ; MD is not an actor ; MD is not pretty.  
a. D only                      b. C only                      c. A only                      d. B and C
130. A. All IIMs are in India. No BIMs are in India. No IIMs are BIMs.  
B. All IIMs are in India. No BIMs are in India. No BIMs are IIMs.  
C. Some IIMs are not in India. Some BIMs are not in India. Some IIMs are BIMs.  
D. Some IIMs are not in India. Some BIMs are not in India. Some BIMs are IIMs.  
a. A and B                      b. C and D                      c. A only                      d. B only
131. A. Citizens of Yes Islands speak only the truth. Citizens of Yes Islands are young people. Young people speak only the truth.  
B. Citizens of Yes Islands speak only the truth. Some Yes Islands are in Atlantic. Some citizens of Yes Islands are in the Atlantic.  
C. Citizens of Yes Islands speak only the truth. Some young people are citizens of Yes Islands. Some young people speak only the truth.  
D. Some people speak only the truth. Some citizens of Yes Islands speak only the truth. Some people who speak only the truth are citizens of Yes Islands.  
a. A only                      b. B only                      c. C only                      d. D only
132. A. All mammals are viviparous. Some fish are viviparous. Some fish are mammals.  
B. All birds are oviparous. Some fish are not oviparous. Some fish are birds.  
C. No mammal is oviparous. Some creatures are oviparous and some are not. Some creatures are not mammals.  
D. Some creatures are mammals. Some creatures are viviparous. Some mammals are viviparous.  
a. A only                      b. B only                      c. C only                      d. D only
133. A. Many singers are not writers. All poets are singers. Some poets are not writers.  
B. Giants climb beanstalks. Some chicken do not climb beanstalks. Some chicken are not giants.  
C. All explorers live in snowdrifts. Some penguins live in snowdrifts. Some penguins are explorers.  
D. Amar is taller than Akbar. Anthony is shorter than Amar. Akbar is shorter than Anthony.  
a. A only                      b. B only                      c. B and C                      d. D only
134. A. A few farmers are rocket scientists. Some rocket scientists catch snakes. A few farmers catch snakes.  
B. Poonam is a kangaroo. Some kangaroos are made of teak. Poonam is made of teak.
-

- C. No bulls eat grass. All matadors eat grass. No matadors are bulls.  
 D. Some skunks drive Cadillacs. All skunks are polar bears. Some polar bears drive Cadillacs.
- a. B only                      b. A and C                      c. C only                      d. C and D

**Directions for questions 135 to 138:** Answer the questions based on the following information.

The figure below represents sales and net profit in Rs. crore of IVP Ltd. for five years from 1994-95 to 1998-99. During this period the sales increased from Rs. 100 crore to Rs. 680 crore. Correspondingly, the net profit increased from Rs. 2.5 crore to Rs. 12 crore. Net profit is defined as the excess of sales over total costs.



135. The highest percentage of growth in sales, relative to the previous year, occurred in  
 a. 1995-96                      b. 1996-97                      c. 1997-98                      d. 1998-99
136. The highest percentage growth in net profit, relative to the previous year, was achieved in  
 a. 1998-99                      b. 1997-98                      c. 1996-97                      d. 1995-96
137. Defining profitability as the ratio of net profit to sales, IVP Ltd., recorded the highest profitability in  
 a. 1998-99                      b. 1997-98                      c. 1994-95                      d. 1996-97
138. With profitability as defined in question 137, it can be concluded that  
 a. profitability is non-decreasing during the five years from 1994-95 to 1998-99.  
 b. profitability is non-increasing during the five years from 1994-95 to 1998-99.  
 c. profitability remained constant during the five years from 1994-95 to 1998-99.  
 d. None of the above

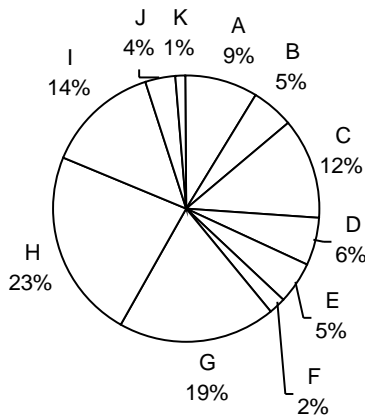
**Directions for questions 139 to 142:** Answer the questions based on the following information

Consider the information provided in the figure below relating to India's foreign trade in 1997-98 and the first eight months of 1998-99. Total trade with a region is defined as the sum of exports and imports from that region. Trade deficit is defined as the excess of imports over exports. Trade deficit may be negative.

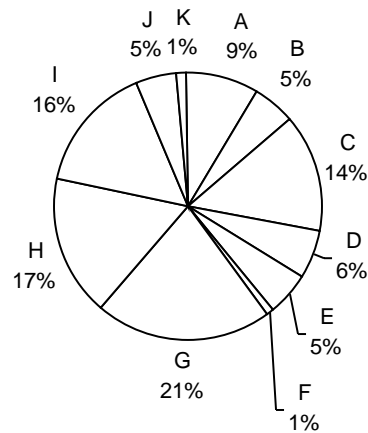
- |             |                                  |
|-------------|----------------------------------|
| A. USA      | G. Other East European countries |
| B. Germany  | H. OPEC                          |
| C. Other EU | I. Asia                          |
| D. UK       | J. Other LDCs                    |
| E. Japan    | K. Others                        |
| F. Russia   |                                  |

### Source of imports

**1997-98**  
Imports into India \$40,779 million

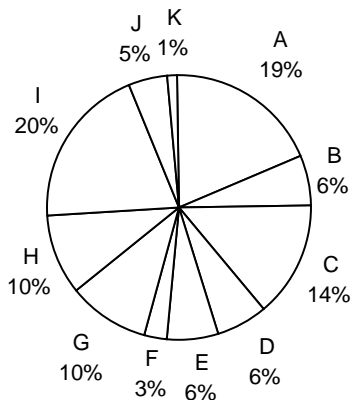


**1998-99**  
Imports into India (April-November) \$28,126 million

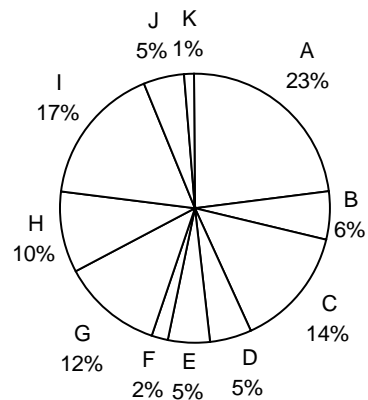


### Destination of exports

**1997-98**  
Exports from India: \$33,979 million



**1998-99**  
Exports from India (April-November) \$21,436 million



139. What is the region with which India had the highest total trade in 1997-98?  
 a. USA                                      b. Other EU countries    c. OPEC                                      d. Others
140. In 1997-98 the amount of Indian exports, million US dollars, to the region with which India had the lowest total trade, is approximately  
 a. 750                                      b. 340                                      c. 220                                      d. 440
141. In 1997-98, the trade deficit with respect to India, billion US dollars, for the region with the highest trade deficit with respect to India, is approximately equal to  
 a. 6.0                                      b. 3.0                                      c. 4.5                                      d. 7.5

142. What is the region with the lowest trade deficit with India in 1997-98?  
 a. USA                                      b. Asia                                      c. Others                                      d. Other EU countries

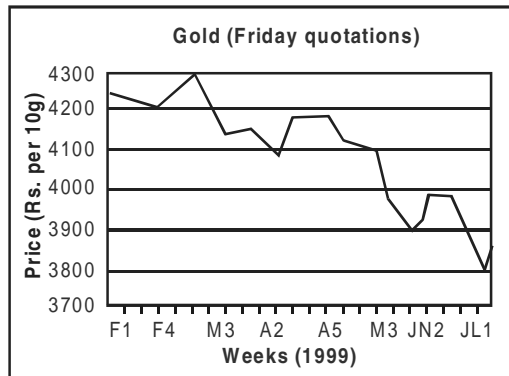
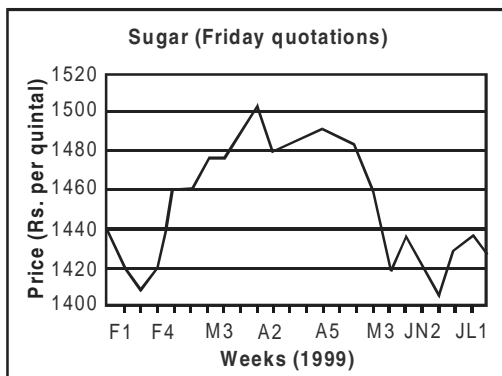
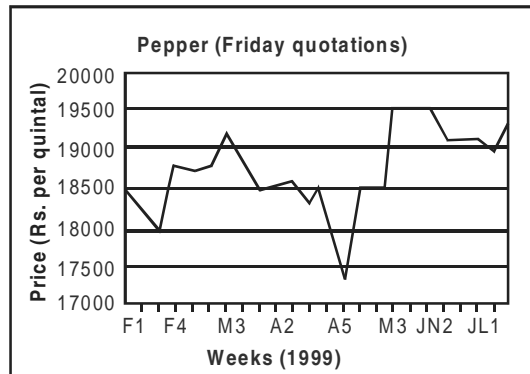
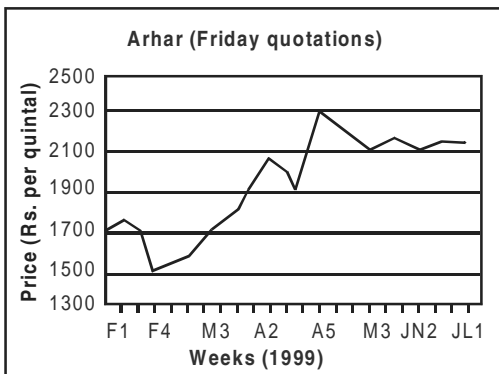
**Directions for questions 143 and 144:** Answer the questions based on the following information.

Assume that the average monthly exports from India and imports to India during the remaining four months of 1998-99 would be the same as that for the first eight months of the year.

143. What is the region to which India's exports registered the highest percentage growth between 1997-98 and 1998-99?  
 a. Other East European countries                                      b. USA  
 c. Asia    d. Exports have declined, no growth
144. What is the percentage growth rate in India's total trade deficit between 1997-98 and 1998-99?  
 a. 43    b. 47    c. 50    d. 40

**Directions for questions 145 to 148:** Answer the questions based on the following information.

These questions are based on the price fluctuations of four commodities — arhar, pepper, sugar and gold during February-July 1999 as described in the figures below.



145. Price change of a commodity is defined as the absolute difference in ending and beginning prices expressed as a percentage of the beginning. What is the commodity with the highest price change?  
 a. Arhar                                      b. Pepper                                      c. Sugar                                      d. Gold

146. Price volatility (PV) of a commodity is defined as follows:  
 $PV = \frac{\text{Highest price during the period} - \text{Lowest price during the period}}{\text{Average price during the period}}$ . What is the commodity with the lowest price volatility?  
 a. Arhar                      b. Pepper                      c. Sugar                      d. Gold
147. Mr X, a fund manager with an investment company invested 25% of his funds in each of the four commodities at the beginning of the period. He sold the commodities at the end of the period. His investments in the commodities resulted in  
 a. 17% profit                      b. 5.5% loss                      c. No profit, no loss                      d. 5.4% profit
148. The price volatility(PV) of the commodity with the highest PV during the February-July period is approximately equal to  
 a. 3%                      b. 40%                      c. 20%                      d. 12%

**Directions for questions 149 to 153:** Answer the questions based on the following information.

The table below presents data on percentage population covered by drinking water and sanitation facilities in selected Asian countries.

**Population covered by drinking water and sanitation facilities**

Percentage coverage

	Drinking water			Sanitation facilities		
	Urban	Rural	Total	Urban	Rural	Total
<b>India</b>	85	79	81	70	14	29
Bangladesh	99	96	97	79	44	48
China	97	56	67	74	7	24
Pakistan	82	69	74	77	22	47
Philippines	92	80	86	88	66	77
Indonesia	79	54	62	73	40	51
Sri Lanka	88	52	57	68	62	63
Nepal	88	60	63	58	12	1

(Source: World Resources 1998-99, p. 251, UNDP, UNEP and World Bank.)

Country A is said to dominate B or  $A > B$  if A has higher percentage in total coverage for both drinking water and sanitation facilities, and, B is said to be dominated by A, or  $B < A$ .

A country is said to be on the coverage frontier if no other country dominates it. Similarly, a country is not on the coverage frontier if it is dominated by at least one other country.

149. Which countries are the countries on the coverage frontier?  
 a. India and China                      b. Sri Lanka and Indonesia  
 c. Philippines and Bangladesh                      d. Nepal and Pakistan

150. Which of the following statements are true?  
 A. India > Pakistan and India > Indonesia      B. India > China and India > Nepal  
 C. Sri Lanka > China      D. China > Nepal  
 a. A and C      b. B and D      c. A, B and C      d. B, C and D
151. Using only the data presented under 'sanitation facilities' columns, it can be concluded that rural population in India, as a percentage of its total population is approximately  
 a. 76      b. 70      c. 73      d. Cannot be determined
152. Again, using only the data presented under 'sanitation facilities' columns, sequence China, Indonesia and Philippines in ascending order of rural population as a percentage of their respective total population. The correct order is  
 a. Philippines, Indonesia, China      b. Indonesia, China, Philippines  
 c. Indonesia, Philippines, China      d. China, Indonesia, Philippines
153. India is not on the coverage frontier because  
 A. it is lower than Bangladesh in terms of coverage of drinking water facilities.  
 B. it is lower than Sri Lanka in terms of coverage of sanitation facilities.  
 C. it is lower than Pakistan in terms of coverage of sanitation facilities.  
 D. it is dominated by Indonesia.  
 a. A and B      b. A and C      c. D      d. None of these

**Directions for questions 154 and 155:** Answer the questions based on the following information.

These relate to the above table with the additional provision that the gap between the population coverages of 'sanitation facilities' and 'drinking water facilities' is a measure of disparity in coverage.

154. The country with the most disparity in coverage of rural sector is  
 a. India      b. Bangladesh      c. Nepal      d. None of these
155. The country with the least disparity in coverage of urban sector is  
 a. India      b. Pakistan      c. Philippines      d. None of these

**Directions for questions 156 to 165:** Each question is followed by two statements I and II.

**Mark:**

- a. if the question can be answered by any one of the statements alone, but cannot be answered by using the other statement alone.  
 b. if the question can be answered by using either statement alone.  
 c. if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.  
 d. if the question cannot be answered even by using both the statements together.
156. The average weight of students in a class is 50 kg. What is the number of students in the class?  
 I. The heaviest and the lightest members of the class weigh 60 kg and 40 kg respectively.  
 II. Exclusion of the heaviest and the lightest members from the class does not change the average weight of the students.
157. A small storage tank is spherical in shape. What is the storage volume of the tank?  
 I. The wall thickness of the tank is 1 cm.  
 II. When an empty spherical tank is immersed in a large tank filled with water, 20 l of water overflow from the large tank.

158. Mr X starts walking northwards along the boundary of a field from point A on the boundary, and after walking for 150 m reaches B, and then walks westwards, again along the boundary, for another 100 m when he reaches C. What is the maximum distance between any pair of points on the boundary of the field?
- The field is rectangular in shape.
  - The field is a polygon, with C as one of its vertices and A as the mid-point of a side.
159. 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 labelled 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?
- The angle between AB and X-axis when measured with a protractor is  $40^\circ$ , and the angle between CB and X-axis is  $80^\circ$ .
  - The scale of Y-axis is 1 cm = Rs. 100
160. There is a circle with centre C at the origin and radius r cm. Two tangents are drawn from an external point D at a distance d cm from the centre. What are the angles between each tangent and the X-axis.
- The coordinates of D are given.
  - The X-axis bisects one of the tangents.
161. Find a pair of real numbers x and y that satisfy the following two equations simultaneously. It is known that the values of a, b, c, d, e and f are non-zero.
- $$ax + by = c$$
- $$dx + ey = f$$
- $a = kd$  and  $b = ke$ ,  $c = kf$ ,  $k \neq 0$
  - $a = b = 1$ ,  $d = e = 2$ ,  $f \neq 2c$
162. Three professors A, B and C are separately given three sets of numbers to add. They were expected to find the answers to  $1 + 1$ ,  $1 + 1 + 2$ , and  $1 + 1$  respectively. Their respective answers were 3, 3 and 2. How many of the professors are mathematicians?
- A mathematician can never add two numbers correctly, but can always add three numbers correctly.
  - When a mathematician makes a mistake in a sum, the error is +1 or -1.
163. How many students among A, B, C and D have passed the examination?
- The following is a true statement: A and B passed the examination.
  - The following is a false statement: At least one among C and D has passed the examination.
164. What is the distance x between two cities A and B in integral number of kilometres?
- x satisfies the equation  $\log_2 x = \sqrt{x}$
  - $x \leq 10$  km
165. Mr Mendel grew 100 flowering plants from black seeds and white seeds, each seed giving rise to one plant. A plant gives flowers of only one colour. From a black seed comes a plant giving red or blue flowers. From a white seed comes a plant giving red or white flowers. How many black seeds were used by Mr Mendel?
- The number of plants with white flowers was 10.
  - The number of plants with red flowers was 70.
-



# CAT 1999 Actual Paper

## Answers and Explanations

1	a	2	d	3	b	4	a	5	c	6	c	7	b	8	c	9	c	10	b
11	c	12	a	13	b	14	d	15	a	16	d	17	a	18	c	19	b	20	a
21	b	22	d	23	c	24	b	25	b	26	a	27	d	28	c	29	d	30	d
31	c	32	b	33	c	34	a	35	c	36	b	37	d	38	a	39	b	40	a
41	d	42	d	43	b	44	c	45	d	46	b	47	a	48	d	49	a	50	c
51	c	52	b	53	d	54	a	55	a	56	a	57	a	58	b	59	c	60	a
61	b	62	a	63	d	64	d	65	a	66	c	67	b	68	c	69	c	70	c
71	d	72	b	73	c	74	a	75	d	76	b	77	a	78	c	79	c	80	b
81	c	82	a	83	b	84	b	85	d	86	a	87	a*	88	*d	89	d	90	b
91	b	92	c	93	d	94	b	95	d	96	a	97	d	98	d	99	c	100	c
101	c	102	a	103	b	104	a	105	b	106	c	107	a	108	a	109	b	110	d
111	b	112	d	113	a	114	b	115	a	116	d	117	b	118	a	119	b	120	c
121	d	122	d	123	a	124	d	125	c	126	a	127	b	128	c	129	b	130	a
131	c	132	c	133	b	134	d	135	a	136	d	137	b	138	d	139	c	140	b
141	a	142	a	143	b	144	b	145	a	146	c	147	d	148	b	149	c	150	b
151	c	152	a	153	d	154	a	155	c	156	d	157	c	158	c	159	a	160	b
161	d	162	d	163	c	164	c	165	d										

	Question number	Total questions	Total attempted	Total correct	Total wrong	Net Score	Time Taken
EU + RC	1 to 55	55					
QA	56 to 110	55					
CR + DI + DS	111 to 165	55					
Total		165					

1. a (a) ADBC is the correct answer choice. AD is a closely-connected pair. A introduces the shift from functional model in organization theory to a political model and D defines the political model.  
 'Thus' in B and 'At the extreme' in C carry the discussion on the political model further, and C ends by highlighting that the organization structure develops unrelated to functional requirements, in the extreme case.  
 (b) CBAD also has the linked pair AD, but the overall flow of thoughts is not logical. Starting with A and ending with C takes us logically from rejection of one model to discussion on another, as in ADBC.  
 (c) DBCA: Though DBC flows smoothly, A at the end is out of place.  
 (d) ABDC: B intrudes between A and D as we cannot talk of 'analysis of power resources' in B, unless we have defined the political model in D first.
2. d (d) BDCA is the correct answer choice.  
 BD is a mandatory pair, as the pronoun 'this' delicate balance in D refers to nature's delicate balance in B. The 'also' in C guides us towards the analogy between institutions and nature, both requiring a system of checks and balances. And A ends by stating that group decision-making is not necessarily the answer because groups can also function like individuals.  
 (a) CDAB and (c) CABD: The 'also' in C disqualifies it as a contender for the introductory sentence.  
 (b) BCAD: Though C can also follow B smoothly, D at the end is then totally out of place.
3. b (b) CADB is the correct answer choice.  
 C makes a good introductory sentence as it introduces Bennis and his predicament. A, B and D all use pronouns: 'he', 'him', 'his' and 'himself', all referring to Bennis.
4. a (a) DCBA is the correct answer choice.  
 D introduces the intention of the person 'to stage a gastric attack' and the rest explain the sequence of events: D: I ... asked for shampoo mixture ...  
 C: 'Then' feigns gastric attack and asks for some medicine.  
 B: uses shop-telephone to inform the Consulate of his location (probably he also informs the Consulate of his gastric attack).  
 A: 'With that', swallows the shampoo to induce actual gastric attack.  
 The reason for the author's intention, however, remains unclear.  
 (b) DACB also correctly starts with D, but A cannot follow D as he cannot swallow the shampoo mixture in A, until he gets it from the pharmacist in C.  
 (c) BDAC and (d) BCDA. B can possibly start the paragraph, but A cannot come directly after D.
5. c (c) EDACB is the correct answer choice.  
 DA is a mandatory pair, as 'in the early 1990s' in D links chronologically with 'since then' in A links chronologically with 'in the early 1900s' in D. Furthermore, D refers to 'such tests' and, therefore cannot start the paragraph.  
 CB also emerges as a closely-linked pair. 'In other words' in B summarizes succinctly the idea introduced in C.  
 Other options do not meet all the above requirements and hence do not flow logically from start to finish.
6. c (c) is the correct answer choice.  
 All three airlines have reduced their fares to make up for this loss in increased volumes. This decision is obviously based on the general belief or assumption that air travellers in India are price-conscious. If there is a market research study that shows exactly that, then it would add credence to the general belief.  
 (a) The general belief relates reduced fares to increased volumes, not to increased profitability. It is possible to increase profitability by cutting costs, even if volumes do not increase. Hence, the cause – and – effect relationship between reduced fares and increased volumes is not directly supported by this statement.  
 (b) and (d) are irrelevant and do not in any way support or weaken the general belief.
7. b (b) is the correct answer choice  
 Apparently McNeill is a Westerner who is doing some sort of research on the role of the Brahmin priest in ancient Indian society. From the way his thoughts are evolving in the passage (recite–memorize–dissemination–duplicated), McNeill can only understand the role of a Vedic priest by drawing a direct analogy between the Vedic priest, whom he does not understand except superficially, and a recorded audio cassette, which is an essential and ubiquitous item in McNeill's world.  
 (a) and (d) are more or less stated in the passage, so there is no inference involved. '... practice of reciting Vedas was essential ...' means that it was an obligation and '... when the Vedas had not yet been written down ...' means Vedic hymns had not been scripted.  
 (c) also is less of an inference and more of a surmise.
8. c (c) is the correct answer choice.  
 The arrangement emerges somewhat like this:-  
 Premise – I: If developed country, then social security for the elderly.  
 Premise – II: No social security for the elderly in India, as it is not a developed country and also the traditional support system for them is vanishing.  
 Conclusion: Therefore, working people in India must save for their old age.  
 (c) announces the good news for Indian working people:  
 'India will become a developed country in the future,' implying social security for the elderly, thereby weakening the conclusion.  
 (a) and (b) indicate some encouraging future trends, but do not obviate the necessity for Indian working people to save for their old age.  
 (d) Strengthens the conclusion, rather than weakening it.
9. c (c) is the correct answer choice.  
 The surmise or hypothesis in the passage implies that: biodiversity is inversely proportional to educational performance, with poverty playing no role in this relationship.  
 (d) merely confirms the inverse relationship, at all levels of poverty.  
 (a) relates good education performance with high levels of poverty, regardless of biodiversity (variety of flora). It is, therefore, irrelevant.  
 (b) and (c) also support the inverse relationship

between biodiversity and educational performance, but each reserves a role for poverty in this relationship. (c) summarizes better, hence (c).

10. b (b) is the only option that explains how reducing taxes will broaden the tax base. If taxes on cigarettes (which constitute 90% of the revenues) are reduced, the prices of cigarettes will come down, thereby increasing the demand for cigarettes. More the cigarette smokers, the broader the tax base. Options (a) and (c) mention peripheral matters. (d) is talking about increasing duties (taxes) whereas the last sentence of the paragraph has only looked at “reducing taxes”.

11. c (c) is the correct answer choice.  
 (a) undermines Mathews’ theory by showing how population need not follow geometric rate of growth and (b) undermines it by showing how food need not follow arithmetic rate of growth.  
 (d) undermines his theory by pointing out that the inability of our planet to support the growing human population need not lead to disastrous consequences for humans. There are ways that these can be averted.  
 (c) is the only option that does not undermine his theory. It also does not support his theory by referring to the different rates of growth in human and natural systems, but merely asserts that these rates of growth remain constant and cannot be changed.

12. a (a) is the correct answer choice.  
 The picture that emerges from the passage is:

Year	Production (in tonnes)	% increase over previous year
1970 – 71	6,089	—
1997 – 98	5,830	—
1998 – 99	8,079	38.58%

This shows that the average production has remained well below 6,000 tonnes in the previous years. The significant increase of over 2,000 tonnes in 1998–99 was achieved by using all possible productivity enhancing measures.

If all areas have been properly irrigated, if all unproductive coffee bushes have been replaced, if intensive refilling and improved agricultural practices have been used — how much more can be done?

Obviously, the target of 10,000 tonnes (about 70% increase over average of less than 6000 tonnes) is unrealistic, as explained by option (a). Options (b) and (c) also indirectly contribute to making the target of 10,000 tonnes unrealistic. But (a) contributes MOST. (d), on the other hand, supports the target as realistic, by placing faith in the soundness of the target-selling produces.

13. b (b) is the correct answer choice.  
 The first sentence of the passage asserts that: Intelligence of animals is proportionate to the extent of their socializing.  
 Then the passage gives examples of how animals are effective when they are in their own social group and ineffective when they are alone.  
 This is exactly what is given in option (b).  
 (a) and (c) are partly stated in the passage, but do not convey the central message.

(d) cannot be inferred as the passage does not compare the behaviour of elephants and beavers with the behaviour of bees and ants.

14. d (d) is the correct answer choice.  
 It is an example of doing the right thing, ‘at the wrong time.’

In (d), telling a long story could be entertaining or interesting, but not when others have heard it many times before. The intention in (b) and (c) contradicts the definition of an unseasonable man. (a) is irrelevant.

15. a (a) is the correct answer choice.  
 It is also an example of doing the right thing, ‘at the wrong time.’

In (a), getting a higher bidder is helpful to the salesman, but not when he has just closed a deal. He will only curse himself and you. (d) is a matter of choice, not unseasonableness. (b) may be undesirable, but not unseasonable. There is nothing unseasonable about (c) either.

16. d (d) is the correct answer choice.  
 The question relates to choosing the correct pronoun case: Subjective (we) or objective (us). The answer to the question ‘who had left before he arrived?’ is ‘we’, not ‘us’: ‘We’ is the subject of the verb ‘had left’ and the referent of the relative pronoun ‘who,’ which is also in the subjective case.

(b) and (c) are incorrect because they use ‘Us’ the objective case. They also have other obvious errors.  
 (a) Uses the correct pronoun case (We), but incorrectly places both verbs ‘had left’ and ‘had arrived’ in the past perfect tenses. For indicating that one event has occurred in the past before another, the former should be placed in past perfect tense, while the latter in simple past tense.

17. a (a) is the correct answer, as it corrects all the errors in the original sentence. Other options do not.

Redundancy:

(i) ‘rose up’: ‘rise’ includes the idea of upward motion.  
 (ii) ‘in her opinion, she thought’: use either ‘in her opinion’ or ‘she thought’.

Idiom (iii) ‘passed on’: Bills are always ‘passed’ in Parliament. ‘Pass on’ is a phrasal verb and has its own uses.

18. c (c) is the correct answer choice.  
 This question tests you for parallelism. There are two possible parallel structures:

(i) Mr Pillai, X and Y, will be ... (phrase X and Y placed in apposition).

(ii) Mr Pillai, who is X and also Y, will be ... (use of who-clause)

There are also other ways to express the same idea but with different shades of meaning/emphasis:

(iii) Since Mr Pillai is X and Y, he will be ... (two main clauses joined by ‘some’ as a conjunction).

(iv) Being X and Y, Mr Pillai will be ... (use of participial clause).

Answer choice (c) matches with (i) above. Other choices do not match with any of the other possible grammatical structures.

19. b (b) is the correct answer choice.  
This question tests you for use of the correct verb tense. Possible constructions could be:  
(i) At the beginning of this decade, X took a giant stride ...  
(ii) Use present perfect, when we talk of a period of time extending from a point in the past and completion of an action 'since' then, as seen from today's perspective.  
(b) matches with (ii) above and correctly uses the present perfect tense. The phrase 'at the beginning of this decade' is merely placed in opposition to inform us about the 'advent of cable television,' and does not in any way affect the structure of the sentence.
20. a (a) is the correct answer choice.  
The main verb 'made great sacrifices' in the main clause is modified by both participial clauses to explain the sacrifices she made:  
(i) 'moving house on three occasions.'  
(ii) 'severing the thread ... to make him understand the need to persevere.'  
In (b) and (c), 'severed' (simple past tense) is used parallel with 'made', thereby producing two parallel main clauses. This is not grammatically incorrect, but changes the intended meaning, which was to highlight 'severing of the thread ...' as a 'sacrifice' the mother made.  
(d) uses 'severing' correctly, but incorrectly replaces 'him' referring to Mencius by 'them.'
21. b (b) is the correct answer choice.  
The question tests you for the correct positioning of the adverbial phrase 'in two weeks.' Since this phrase relates to 'putting together a programme,' it should be positioned closest to the verb phrase it modifies. The possible positions are examined below:  
(i) 'You've put together (in two weeks) a programme ...'  
[Incorrect. Adverb cannot come between the verb and its object.]  
(ii) 'You've put together a programme (in two weeks) that solves ...'  
[Incorrect. Here the adverb cannot separate the noun 'program' and the relative pronoun. 'that', which modifies it.]  
(iii) '(in two weeks) you've put together a programme ...'  
[Correct. The adverbial phrase is close to the verb it modifies and is not intrusive in this position.]  
In (a) and (c), the intended meaning changes. It appears that 'the problem is solved in two weeks,' rather than 'the programme being put together in two weeks'.  
(d) is incorrect as the adverbial phrase 'in two weeks' should be cordoned off by two commas, and introduction of "only" changes the meaning.
22. d (d) is the correct answer choice.  
The question tests you for the correct idiomatic structure to be used with the verb 'proclaim.' 'Proclaim,' unlike 'claim,' cannot be followed by a to-infinitive. It should be followed by a that-clause in this case. Therefore, (d) is correct, while (a) and (c) are incorrect. Though (b) correctly uses the that-clause, the present continuous tense 'are saving' changes the meaning. The simple present tense 'save' is appropriate here to indicate a general sense. Furthermore, 'less' itself is a comparative (little → less → least) and need not be replaced by the double comparative 'lesser,' which is used only in certain standard idiomatic phrases, such as, 'the lesser of the two evils.'
23. c (c) is the correct answer choice.  
The question tests you for the correct use of passive voice and the positioning of adverbs. First, 'end' cannot be the doer of the action: 'would delay,' but it should correctly be at the receiving end: 'would be delayed (passive voice).' Second, both the adverbs 'otherwise' and 'only' are required for the intended meaning to emerge clearly. Third, these adverbs should be positioned closest to the verb they modify. What better place than to be sandwiched between the auxiliary verb and the main verb: 'Would be otherwise only delayed.'
24. b (b) is the correct answer choice: This answer emerges from para 2, second sentence: "... WTO was a product of a series of trade-offs between principal actors and groups." The important players were essentially the United States; Europeans; countries like Canada and other middle and smaller trading partners; and the developing countries, which continued negotiations as part of the Uruguay Round till the 1990s. The Tokyo Round of the 1970s was an attempt at a 'constitutional reform' of the GATT, while what the important players eventually settled for in the WTO was the evolution of a rules-based system through multiple negotiations which obviously required time.  
(a): Though it is mentioned in para 1 that 'the US government wanted to put off the Tokyo Round of the 1970s to the future', but it is clear from para 2 that other important players also first wanted to evolve a rules-based system through negotiations before agreeing to anything binding on them.  
(c) is factually incorrect in light of para 3, and as such has no relevance to the non-formation of WTO in the 1970s. (d) is incomplete as 'the Tokyo Round negotiation was an attempt at constitutional reform of GATT,' and not related to formation of a new organization, WTO, as such.
25. b (b) is the summary of what is discussed in the second paragraph and emerges from the last sentence of the paragraph. (a), (c) and (d) are also stated in the second paragraph but as individual considerations that went into the formulation of the WTO package. (b) sums it up succinctly.
26. a (a) is the correct answer choice.  
In paragraph 3, the passage defines 'legal development' as 'the promotion of the technical legal values of consistency, clarity and effectiveness. And these values were achieved in the WTO through (a) consistency: integrating under one roof of the agreements signed under GATT.  
(b) Clarity: removing ambiguities about the powers of constructing parties to make certain decisions.  
(c) Effectiveness: eliminating grandfather rights exceptions and defects in dispute settlement procedure.  
Option (a) only covers how the value of consistency was achieved, option (c) relates to the value of effectiveness, but omits the word 'eliminating' and

option (d) relates to the value of clarity, but omits the word 'removing'. This omission renders these options incomplete, and hence disqualifies them as possible correct answers. Thus, option (a) 'partly' (as in the question stem) answers the question how technical legal values were promoted in the WTO. Option (b) is an observation, not a step.

27. d (d) is the correct answer choice  
The question stem alludes to the 'teleological method of interpretation,' whereby action of member states were evaluated against the accomplishment of community goals. (paragraph 4, lines 7 and 8). The other choices (a), (b) and (c) do not touch this main point.
28. c (c) is the correct answer choice. The 'benefits of international trade' (para 2, lines 11 and 12) refer to 'the export gains' (para 2, line 14) as brought out in option (c). Whereas option (b) only talks about the export gains and option (d) only about a rule-based system. (a) is a misleading choice.
29. d (d) is the correct answer choice.  
Since 'the doctrine of mutual recognition handed down (by the European Court and Justice) in the case Cassis de Dijon was a key turning point,' and 'the court is recognized as a major player in European integration', join these together and you get option (d) as the correct option (para 4, lines 3 to 5). Options (a), (b) and (c) are also mentioned in para 4, but are not directly related to the Cassis de Dijon case as such.
30. d (d) is the correct answer choice.  
All the three issues raised in options (a), (b) and (c) are arguments against abstract art, as discussed in para 2.
31. c (c) is the correct answer choice.  
It echoes the words in para 1, lines 7 and 8. 'Something they can relate to and understand immediately without too much thought'. (a), (b) and (d) are peripheral observations.
32. b (b) is the correct answer choice.  
This can be inferred from para 3, lines 6 and 7. 'If he had used representational images and colour, much of the emotional content would have been lost and the piece (Guernica) would not have caused the demand for justice that it did.' (c) is a shocking choice. (d) is not true at all. (a) is just the background for the painting.
33. c (c) is the correct answer choice and directly emerges from para 3, last two lines. (a) may be an isolated opinion. (b) and (d) are irrelevant to the question.
34. a (a) is the correct answer choice.  
Para 4 discusses how each deals with 'reality' on canvas:-  
(i) Representational artist: What he sees with his eyes – he reproduces on canvas.  
(ii) Abstract artist: What he feels about what his eyes see – he interprets on canvas.  
Option (b) is incorrect as nowhere in the passage does the author talk about one being superior to the

other. The author's point of view is that the critics of abstract art fail to see its merit, both forms are different and have their own merits.  
Options (c) and (d) are irrelevant to the question asked. (c) is refuted in the passage and (d) is rather a tall claim. (a) is a lopsided observation.

35. c (c) is the correct answer choice.  
The concept that because humans can perceive the world around them, they are the 'revealers' of reality, has been highlighted in the second para: '... that man is the means by which things are manifested'. — 'With each of our acts, the world reveals to us a new face'. Option (a), though implicit in the passage, is not the central point of the author.  
Option (b) and (d) talk of the unity of nature, but it is not relevant to the central idea of the passage.
36. b (b) is the correct answer choice. Refer para 3, lines 4 - 6 especially the fifth line.
37. d (d) is the correct answer choice.  
The author distinguishes between perception and creation in the following manner:-  
i) Perception: Man, the subject, is essential as 'revealer' of objects around him but not essential to the existence of the objects.  
In other words, if there is no object, there is nothing for men to perceive or 'reveal', but object can exist whether man is there to perceive it or not.  
(ii) creation: Man creates in order to feel essential in the world around him. So, it is the creative activity that is essential, not man's creations (paintings, writing, etc.)  
All other options are either irrelevant or do not capture the essence of the meaning.
38. a (a) is the correct answer.  
The writer is the creator (subject) of the 'literary work' (object). To the writer, the very act of writing is essential, not his literary work. On the other hand, the reader (subject) is essential as the revealer of this literary work/the object of someone else's creation. But the reader is not essential to the existence of this literary work, which can exist even if there is no one to read it. This is how the dialectic of perception and creation manifests itself in the art of writing. Only option (a) captures the essence.
39. b (b) is the correct answer choice, because the writer makes us (readers) essential as revealers of what is written in the writer's literary work (the created object which is now part of the world around us). Can be inferred from para 2. (a), (c) and (d) are not accurate inferences from the passage.
40. a (a) is the correct answer choice.  
The nation-state was expected to guarantee the happiness of individuals in the name of (para 1, lines 2 and 3):-  
– Modernization in the West [not development in the West, as in option (c).]  
– Socialism in the Eastern Bloc [not modernization in the Eastern Bloc, as in option (d).]  
– Development in the Third World (as in option (a), not socialism in the Third World, as in option (b).]

41. d (d) is the correct answer choice.  
Para 3 highlights that demands of communities and groups for recognition of their identities can be viewed:  
(i) positively: as liberation movements, against oppression and injustice.  
(ii) negatively: as militant action, when the search and assertion for their identity can result in intolerance of others.  
Options (a), (b) and (c) together cover the full group. Hence, (d) all of these is the correct answer.
42. d (d) None of the above is the correct answer. Choice as option (a), (b) and (c) are all true about the nature of identity as per the author.  
Option (a) – para 5, line 1  
Option (b) – para 6, line 1  
Option (c) – para 5, line 2
43. b (b) is the correct answer choice, as emerges from the last two lines of para 1: ‘the state can use its powerful resources to reject the demand of its communities; it may even go so far as genocide to ensure that order prevails’. Other options are not correct as per para 1, which on the contrary, discusses the failures of the nation state.
44. c (c) is the correct answer choice, as nowhere has the author said that the nation state represents the demands of communities within it. On the contrary, para 1, lines 6 and 7 state: ‘Distributed by the claims of communities within it, the nation state tries to repress their demands ...’  
Option (a), (b) and (d), on the other hand, are true about the nation state as per para 1.
45. d (d) The primary purpose of this passage is to compare the Western ‘strategic culture’ with that of Asians and highlight the ‘cultural divide’, rather than a technical one. Options (a) and (c) deal with technical issues of war, whereas option (b) deals with the issue of morale. Only option (d) supports the ‘cultural divide’. Paras 7-8 reveal some of the reasons for America’s defeat at Vietnam.
46. b (b) is the correct answer choice, and is the metaphor for the western way of war, as opposed to ‘a stealthy archer’, which embodies the eastern way of war (last but one para, lines 7 and 8).  
Options (a) (para 2, line 1), (c) (para 5, line 4 and 5) and (d) (para 4, line 1 to 3) all describe the ‘Asian’ way of war.
47. a (a) is the correct answer choice.  
Sun-tzu believed in ‘subduing an adversary without fighting (para 4, lines 1 to 3), and not through actual combat, as stated in option (a).  
Other options: (b) is stated at para 5, lines 1 and 2; (c) and (d) are stated in last but one para, lines 1 and 2, where it is stated that both Sun-tzu and Clausewitz had similar views on (c) and (d).

48. d (d) is the correct answer choice.  
The important differences in the concept of war of Clausewitz and Sun-tzu are summarized below:

		Clausewitz	Sun-tzu
(i)	Structure	Massed Battle in an open area	Persistent indirect attacks to weaken enemy through isolation, poor morale and disunity
(ii)	Time	Finite extent of time, say, few months	Long drawn-out, over several years
(iii)	Sequence of War	Fixed course with a beginning, a middle and an end.	No fixed sequence. But use full might of the army in a final quick and clean operation, when enemy has been considerably weakened

Option (a) is incorrect, as both were opponents of militarism, of turning the war over to the generals.  
Option (b) is incorrect, as both were sophisticated as strategic theorists.  
Option (c) does highlight a difference, but (d) is far more comprehensive.

49. a (a) is the correct answer choice, and directly emerges from the last para, last two lines.  
Option (b) and (c) are nonsensical.  
As regards option (d), ‘bows and arrows’ metaphorically represent the Asian way of war, not literally.
50. c (c) is the correct answer choice, as it captures the essence of the passage: difference in strategic culture between the West and Asia leading to America’s failure to understand the Asian culture of war. (a) and (b) are minor reasons. (d) is doubtful. The ninth para and specifically lines 1-3 deal with this aspect.
51. c (c) BADC is the correct answer choice.  
B connects up well with 1 to introduce the topic: ‘Use of Humour in Advertising’. There are ‘two grounds’ why an ad can be ineffective. ‘At times’ in A and ‘Again’ in D guide the reader to the “two grounds.” B–A–D are, hence, logically connected. 1-B is a good pair because ‘making people laugh’ is qualified further in B.
52. b (b) DBAC is the correct answer choice.  
1. places focus on a “mud hump” and D describes “the hump is alive ...”. Hence, 1D is a mandatory pair. BA is another mandatory pair. B talks about ‘the proportion of soldiers to workers’ and A talks about ‘unsettling the balance’.  
A–C–6 are also connected. C talks about ‘restoring of fortunes’ by the ‘queen termite laying eggs on a as-required basis’ to make up the losses. And 6 wonders at this ‘mysterious ability’ of the queen termite.

53. d (d) BDCA is the correct answer choice. 'these years' in B connects to 'three to five years' in 1. Then 'this correlation' in D connects to what is elaborated in B. C then talks about 'the reason' for this correlation, which is elaborated in A: 'a large vocabulary and a sense of grammar and sentence structure,' and is summed up in 6 as: "comprehension of language is high. Hence, we get 1-BDCA-6.

54. a (a) DACB is the correct answer choice. 1 introduces the topic: 'High-powered outboard motors (OBM) ... threats to ... Beluga whales'. D takes us back to the low-powered 'first OBMs' ... in the early 1930s'. 'With these' in A refers to the first OBMs' in D and not to 'high powered OBMs' in 1, as the context makes clear later. Hence, A follows D rather than 1. This rules out option (b) and (c). C brings us back to the present, contrasting ('however') the ineffectiveness of 'much more powerful engines' of today with the effectiveness of 'the first OBMs' of the early 1930s. B and 6 then explain the reason for the ineffectiveness of today's high-powered OBMs: the 'avoidance strategy' of the Beluga whales. Hence, 1 - DACB - 6 flows logically as explained above.

55. a (a) BADC is the correct answer choice. The paragraph is trying to say that science textbooks and other scientific writings do not present the advance of science in the correct historical perspective and thereby present science as 'a series of individual discoveries and inventions ... (6)'. 'Those misconstructions' in B connects it with 1, leading to BADC as the correct answer choice. B is followed by A, which tells us why science textbooks are arranged as they are and D praises 'this technique of presentation' as 'unexceptionable as pedagogy.' 'But' in C contrasts with D and guides the reader to the incorrect 'impression that is likely to follow.' This impression is elaborated in 6.

56. a The difference between two integers will be 1, only if one is even and the other one is odd.  $4x$  will always be even, so  $17y$  has to be odd and hence,  $y$  has to be odd. Moreover, the number  $17y$  should be such a number that is 1 less than a multiple of 4. In other words, we have to find all such multiples of 17, which are 1 less than a multiple of 4. The first such multiple is 51. Now you will find that as the multiples of 17 goes on increasing, the difference between it and its closest higher multiple of 4 is in the following pattern, 0, 3, 2, 1, e.g.  $52 - 51 = 1$ ,  $68 - 68 = 0$ ,  $88 - 85 = 3$ ,  $104 - 102 = 2$ ,  $120 - 119 = 1$ ,  $136 - 136 = 0$ . So the multiples of 17 that we are interested in are 3, 7, 11, 15. Now since,  $x \leq 1000$ ,  $4x \leq 4000$ . The multiple of 17 closest and less than 4000 is 3995 ( $17 \times 235$ ). And incidentally, 3996 is a multiple of 4, i.e. the difference is 4.

This means that in order to find the answer, we need to find the number of terms in the AP formed by 3, 7, 11, 15 ... 235, where  $a = 3$ ,  $d = 4$ . Since, we know that  $T_n = a + (n - 1)d$   
 $\Rightarrow 235 = 3 + (n - 1) \times 4$   
Hence,  $n = 59$ .

**Alternate Solution:**

$$4x - 17y = 1 \text{ and } x \leq 1000$$

so  $17y + 1 \leq 4000$  i.e.  $y \leq 235$  and moreover every 4th value of  $y$  with give value of  $x$ .

$$\text{So number of values} = \frac{235}{4} \approx 58$$

Hence, total number of terms will be  $58 + 1 = 59$ .

57. a  $(ab)^2 = ccb$ , the greatest possible value of 'ab' to be 31. Since  $31^2 = 961$  and since  $ccb > 300$ ,  $300 < ccb < 961$ , so  $18 < ab < 31$ . So the possible value of  $ab$  which satisfies  $(ab)^2 = ccb$  is 21. So  $21^2 = 441$ ,  $\therefore a = 2, b = 1, c = 4$ .

58. b **Note:**  $342 = 7^3 - 1$ . On further simplification we get,  

$$= \frac{(7^3)^{28}}{342} = \frac{343^{28}}{342} = \frac{(342 + 1)^{28}}{342} = \frac{342N + 1}{342} = \frac{1}{342}$$
  
Hence, remainder = 1, option (b).

59. c The answer is  ${}^{10}C_2 \times 11 + {}^{11}C_2 \times 10 = 45 \times 11 + 55 \times 10 = 1045$ .

60. a At least 1 and at most  $n$  are to be selected  
 $\Rightarrow {}^{2n+1}C_1 + {}^{2n+1}C_2 + \dots + {}^{2n+1}C_n = 63$   
 $\Rightarrow \frac{1}{2}(2^{2n+1} - 2) = 63$   
 $\Rightarrow n = 3$

61. b  $18 \propto \sqrt{9}$   
 $42 \propto \sqrt{x}$ ; Here  $x$  = number of compartments  

$$\frac{18}{42} = \frac{\sqrt{9}}{\sqrt{x}}$$

Simplifying,  $x = 49$ , but this is with reference to maximum speed. Hence number of compartments would be one less in order to run i.e. 48.

62. a Let  $x$  be the fixed cost and  $y$  the variable cost  
 $17500 = x + 25y$  ... (i)  
 $30000 = x + 50y$  ... (ii)  
Solving the equation (i) and (ii), we get  
 $x = 5000, y = 500$   
Now if the average expense of 100 boarders be 'A'. Then  
 $100 \times A = 5000 + 500 \times 100$   
 $\therefore A = 550$ .

63. d Men Women  
40% 60%  
Out of 40% men, 75% earn more than Rs. 25,000.  
Hence, 30% of the company (men) earn more than Rs. 25,000.  
But, in all 45% of the employees earn more than Rs. 25,000.  
Hence, among women 15% earn more than Rs. 25,000 and the remaining (60 - 15)% earn less than or equal to Rs. 25,000.

$$\text{Therefore, the fraction of women} = \frac{45}{60} = \frac{3}{4}.$$

64. d  $|r - 6| = 11 \Rightarrow r - 6 = 11, r = 17$   
or  $-(r - 6) = 11, r = -5$   
 $|2q - 12| = 8 \Rightarrow 2q - 12 = 8, q = 10$   
or  $2q - 12 = -8, q = 2$

$$\text{Hence, minimum value of } \frac{q}{r} = \frac{10}{-5} = -2.$$

65. a Use the method of simulation, viz. take any sample values of  $x$  and verify that  $n$  is both odd as well as a perfect square.

**Alternate solution:**

$$\begin{aligned} \text{Let } x &= (n - 1) n (n + 1) (n + 2) \\ &= (n^2 - 1) n(n + 2) \\ &= n^4 + 2n^3 - n^2 - 2n \\ p &= x + 1 = n^4 + 2n^3 - n^2 - 2n + 1 \\ &= (n^2 - n + 1)^2 \end{aligned}$$

66. c Let 'a' be the percentage of people who favoured exactly one proposal, 'b' be the percentage of people who favoured exactly by two proposals and 'c' be the percentage of people who favoured exactly three proposals.

$$a + b + c = 78 \quad \dots (i)$$

$$a + 2b + 3c = 100 \quad \dots (ii)$$

$$(ii) - (i) \text{ implies } b + 2c = 22$$

$$\text{Since } c = 5, b = 12$$

$$\text{Required percentage} = b + c = 12 + 5 = 17\%.$$

67. b If there are  $n$  numbers, the function  $h$  has to be performed one time less.

68. c Let the radius of the outer circle be  $OQ = x$ .

$$\text{Hence, perimeter of the circle} = 2\pi x$$

$$\text{But } OQ = BC = x \text{ (diagonals of the square } BQCO)$$

$$\text{Perimeter of } ABCD = 4x$$

$$\text{Hence, ratio} = \frac{2\pi x}{4x} = \frac{\pi}{2}.$$

69. c Test the boxes labelled — Red and White.  
Now if the ball is Red, label the box — Red  
Now the box which has the label White is either Red or Red and White.  
However, it cannot be Red.  
Hence, it is Red and White.  
The last box is White.

70. c The square root is 1111111111.

71. d According to the given conditions, either Mrs Border or Mrs Dennis can sit to the right of Mr Abraham. It can't be Mrs. Elmer as she sat two places to the right of Mrs. Border.

72. b At 7.30 a.m., Navjivan Express is at 50 km from A at the same time, Howrah-Ahmedabad Express is at 20 km from B.

Hence, distance between the trains at 7.30 a.m. is 30 km.

$$\text{Relative speed} = 50 + 40 = 90 \text{ kmph}$$

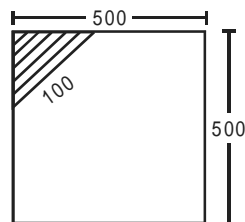
$$\text{Hence, time left} = \frac{30}{90} = \frac{1}{3} \text{ hr} = 20 \text{ min.}$$

73. c Following rule should be used in this case: The perimeter of any polygon circumscribed about a circle is always greater than the circumference of the circle and the perimeter of any polygon inscribed in a circle is always less than the circumference of the circle. Since, the circles is of radius 1, its circumference will be  $2\pi$ . Hence,  $L1(13) > 2\pi$  and  $L2(17) < 2\pi$ .

$$\text{So } \{L1(13) + 2\pi\} > 4\pi.$$

$$\text{Hence, } \frac{\{L1(13) + 2\pi\}}{L2(17)} \text{ will be greater than 2.}$$

74. a



Area of shaded region

$$= \frac{1}{2} \times \frac{100}{\sqrt{2}} \times \frac{100}{\sqrt{2}} = 2,500 \text{ sq m}$$

Area of a  $\Delta$  is maximum when it is an isosceles  $\Delta$ .

$$\text{So perpendicular sides should be of length } \frac{100}{\sqrt{2}}.$$

#### For questions 75 to 77:

75. d It is given that  $Q > P$  and  $R > S$ .

$$Q \ P \ R \ S$$

$$4 \ 2 \ 3 \ 1$$

$$2 \ 1 \ 4 \ 3$$

The distribution of coins can be of two types in both the cases, S gets an odd number.

76. b P Q R S

$$1 \ 3 \ 4 \ 2$$

$$2 \ 4 \ 3 \ 1$$

Clearly, Q gets more coins than S in both the cases.

77. a R S Q P

$$4 \ 2 \ 3 \ 1$$

$$4 \ 1 \ 3 \ 2$$

$$4 \ 3 \ 2 \ 1$$

Looking at the possible distribution of coins, we find that option (a) is not always true.



For questions 78 to 80:

Place of worship	Number of flowers before offering	Number of flowers offered	Number of flowers left
1	$(15/8)y$	$y$	$(7/8)y$
2	$(7/4)y$	$y$	$(3/4)y$
3	$(3/2)y$	$y$	$y/2$
4	$y$	$y$	0

Starting from the fourth place of worship and moving backwards, we find that number of flowers before

entering the first place of worship is  $\frac{15}{8}y$ .

78. c Hence, number of flowers before doubling =  $\frac{15}{16}y$   
(but this is equal to 30)  
Hence,  $y = 32$

79. c The minimum value of  $y$  so that  $\frac{15}{16}y$  is a whole number is 16.  
Therefore, 16 is the minimum number of flowers that can be offered.

80. b For  $y = 16$ , the value of  $\frac{15}{16}y = 15$ .  
Hence, the minimum number of flowers with which Roopa leaves home is 15.

81. c If the mixture is to be made 100 times as sweet as glucose, its sweetness should be 74. The ratio in which saccharin and sucrose be mixed to get the above level of sweetness is given by the following alligation table.

Individual sweetness	Saccharin 675	Sucrose 1
Desired sweetness	74	
Ratio of the individual quantities	73	601

In other words, it means to achieve the given level of sweetness, you need to add 601 g of sucrose to 73 g of saccharin. Hence to 1 g of saccharin, the amount

of sucrose to be added is  $\frac{601}{73} = 8.23$  g.

82. a  $\frac{[(0.74) + (1.000)2 + (1.7)3]}{6} = 1.31$ .

For questions 83 and 84:

D, a lawyer is married to A, a housewife.

C, an accountant is married to F, a lecturer.

E is not a housewife.

Hence, E is an architect and B is a housewife.

Also, any lady is neither an architect nor an accountant

A	Lawyer	Male
B	Housewife	Female
C	Accountant	Male
D	Housewife	Female
E	Architect	Male
F	Lecturer	Female

83. b      84. b

For questions 85 and 86:

If the positions from left to right are 1 to 7

A and G take up positions 6 and 7

B takes up position 4

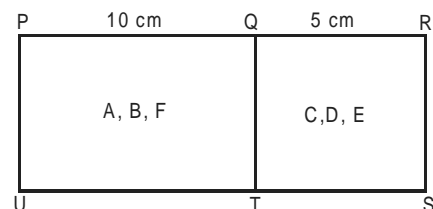
C and D are in places 1 and 5, so that they are as far as possible.

E and F are in positions 2 and 3.

1	2	3	4	5	6	7
C/D	E/F	F/E	B	D/C	A/G	G/A

85. d      86. a

For questions 87 & 88:



87. \*a The sides of the rectangle PRSU are  $PR = 15$  cm and  $RS = 10$  cm.

$\therefore$  Its diagonal =  $\sqrt{15^2 + 10^2} = \sqrt{325} \approx 18$  cm.

Given that the minimum distance between any pair of points formed by taking one from A, B and F and the other from C, D and E is  $10\sqrt{3} = \sqrt{300} \approx 17$  cm, which is close to the length of the diagonal of PRSU. This implies that each of A, B and F are close to one of the vertices P or U and each of C, D and E are close to one of the vertices S or R.

Note that all the three points in one of the rectangles PQTU and QRST will be close to the same vertex (or else the minimum distance between one of these points and one of the three in the other rectangle will be less than  $10\sqrt{3}$  cm). Also, the points (A, B, F) and (C, D, E) have to be diagonally opposite as maximum distance between two vertices on same side is 15 cm.

**Option (a):** The closest two points of the given six points have to be any two out of A, B, F or any two out of C, D, E (since they are closest to the same vertex). Therefore, (F, C) cannot be the closest pair of points as they are diagonally opposite.

**Option (b):** It is definitely false as A and B are close to the same vertex, while F and C are close to diagonally opposite vertices.

**Option (c):** It is possible but not necessary that the closest pair of points among the six given points is (C,D), (D, E) or (C, E). The other possibilities are (A, B), (B,F) or (A,F).

88. \*d The maximum possible distance between the pairs (C,D), (D,E) or (C, E) is the length of the diagonal of the rectangle QRST, i.e.  $\sqrt{10^2 + 5^2} = 5\sqrt{5}$  cm.

Since  $AB > AF > BF = 6\sqrt{5}$  cm, the closest pair of points of the given six points will be from the set (C, D, E). As  $CD > DE > CE$ , so (C, E) will be the pair of closest points.

**\*Note:** There is slight inconsistency regarding the information given in the question. If  $BF = 6\sqrt{5} \approx 13.4$  cm, then A, B and F cannot be close to the same vertex as the length of the diagonal of rectangle PQTU is 14 cm approximately. This in turn will contradict the fact the minimum distance between any point of A, B, F and the other from C, D, E is  $10\sqrt{3}$  cm.

A likely possibility is that the information regarding minimum distance between any point of (A, B, F) and the other from (C, D, E) is specific to question no. 87 only.

89. d The graph  $F(x)$  represents the function  $F(x) = |x|$ , where  $x$  is any real number.  
The graph of  $F_1(x)$  represents the function  $F_1(x) = -x$ , where  $x$  is any real number.  
None of the given relationships are satisfied by these two functions.  
**Alternate solution:**  
 $F_1(-2) = 2 = F(-2)$  and  $F_1(2) = -2$ . But  $F(2) = 2$ .  
So the correct option is (d).

90. b

$$F(x) = \begin{cases} 0 & \text{when } x \geq 0 \\ x & \text{when } x < 0 \end{cases} \text{ and } F_1(x) = \begin{cases} -x & \text{when } x > 0 \\ 0 & \text{when } x \leq 0 \end{cases}$$

Therefore, replacing  $x$  by  $(-x)$  in above functions, we get

$$F(-x) = \begin{cases} 0 & \text{when } x \leq 0 \\ -x & \text{when } x > 0 \end{cases} \text{ and } F_1(-x) = \begin{cases} x & \text{when } x < 0 \\ 0 & \text{when } x \geq 0 \end{cases}$$

Clearly,  $F_1(x) = F(-x)$ , hence, option (b) is the correct choice.

**Alternate solution:**

$$F_1(-2) = 0 = F(2) \text{ and } F_1(2) = -2 = F(-2).$$

So the correct option is (b), i.e.  $F_1(x) = F(-x)$ .

91. b 
$$F(x) = \begin{cases} 0 & \text{when } x \leq 0 \\ -x & \text{when } x > 0 \end{cases} \text{ and } F_1(x) = \begin{cases} x & \text{when } x < 0 \\ 0 & \text{when } x \geq 0 \end{cases}$$

Therefore, replacing  $x$  by  $(-x)$  in above functions, we get

$$F(-x) = \begin{cases} 0 & \text{when } x \geq 0 \\ x & \text{when } x < 0 \end{cases} \text{ and } F_1(-x) = \begin{cases} -x & \text{when } x > 0 \\ 0 & \text{when } x \leq 0 \end{cases}$$

Clearly,  $F_1(x) = F(-x)$ , hence, option (b) is the correct choice.

**Alternate solution:**

$$F_1(-2) = -2 = F(2) \text{ and } F_1(2) = 0 = F(-2).$$

So the correct option is (b), i.e.  $F_1(x) = F(-x)$

92. c 
$$F(x) = \begin{cases} 1-x & \text{when } 0 \leq x < 2 \\ 1 & \text{when } -2 < x < 0 \end{cases} \text{ and}$$

$$F_1(x) = \begin{cases} -1-x & \text{when } -2 < x < 0 \\ -1 & \text{when } 0 \leq x < 2 \end{cases}$$

Therefore, replacing  $x$  by  $(-x)$  in above functions, we get

$$F(-x) = \begin{cases} 1+x & \text{when } -2 < x < 0 \\ 1 & \text{when } 0 \leq x < 2 \end{cases} \text{ and}$$

$$F_1(-x) = \begin{cases} -1+x & \text{when } 0 \leq x < 2 \\ -1 & \text{when } -2 < x < 0 \end{cases}$$

$$\therefore -F(-x) = \begin{cases} -1-x & \text{when } -2 < x < 0 \\ -1 & \text{when } 0 \leq x < 2 \end{cases}$$

$$= \begin{cases} -1-x & \text{when } -2 < x < 0 \\ -1 & \text{when } 0 \leq x < 2 \end{cases} = F_1(x)$$

Hence, option (c) is the correct option.

**Alternate solution:**

$$F_1(2) = -1 = F(2) \text{ and } F_1(-2) = 1 = F(-2).$$

So the correct option is (c), i.e.  $F_1(x) = -F(-x)$ .

93. d Let  $m = 1$ . So, option (a) will give the answer as  $V_m$  and option (c) will give the answer as  $V_1$ . Both of these cannot be the answers as  $V_m$  and  $V_1$  are the amount of volume filled.

Let  $m = 2$ . So, option (b) will give the answer as  $2(1 - V_2)$  and option (d) will give the answer as  $2(1 - V_1)$ . Now consider option (b).

Actual empty volume  $> 2(1 - V_2)$ . Therefore, for this situation  $m(1 - V_1)$  is the only possible answer.

94. b Let  $m = 1$  and  $n = 1$ . Option (a) gives the answer as  $\frac{1}{4}$

and option (d) gives the answer as 'greatest integer

less than or equal to  $\frac{1}{2}$ '. So, both of these cannot be

the answer. Option (b) gives the answer as 'smallest

integer greater than or equal to  $\frac{1}{2}$ ' and option (c)

gives the answer as 1. But the actual answer can be greater than 1 as the volume of the vessel is 2 l. Hence, (b) is the answer.

95. d The ideal approach is to pick up the options one by one.

**Option (a)** – Let S1 and S2 be two sequences of positive numbers. After change of sign, S1 will consist of negative numbers while S2 remains unchanged. Clearly, the members of S1 would be less than that of S2. Hence, option (a) is not correct.

**Option (b)** - Let S1 and S2 be two sequences of positive numbers. After change of sign, S1 will consist of negative numbers while S2 remains unchanged. Clearly, G would remain in S2 itself. Hence, option (b) is not correct.

**Option (c)** – If S1 and S2 had same sign, say positive initially, then the largest number of S1 and S2 would be in S2. Then after the change of sign, every member of S1 will be negative and therefore, less than every member of S2. This implies that the largest number would remain in S2. Hence, option (c) is not correct.

96. a The elements of S1 are in the order :  $a_1 < a_2 < a_3 < a_4 < \dots < a_{24}$

The elements of S2 are in the order:  $a_{25} > a_{26} > \dots > a_{49} > a_{50}$

Even if  $a_{24}$  and  $a_{25}$  are interchanged, the elements of S1 continues to be in ascending order. However, nothing can be concluded about the elements of S2.

97. d Since every element of S1 is less than or equal to each member of S2, L will be in S1 and G in S2.

For some  $i$  ( $1 \leq i \leq 24$ ),  $a_i = L$  and for some  $j$  ( $25 \leq j \leq 50$ ),  $a_j = G$ .

Every other element of S1 is greater than  $a_i$  and every other member of S2 is less than  $a_j$ .

Therefore, to make every element of S1 greater than or equal to that of S2, we need to add a minimum of  $(a_j - a_i) = G - L$ .

**For questions 98 to 100:**

$f(x,y) = |x+y|$  – – – This is always positive

$F(f(x,y)) = -f(x,y) = -|x+y|$  – – – This is always negative

$G(f(x,y)) = -F(f(x,y)) = -(-|x+y|) = |x+y|$  – – – This is always positive

98. d  $F(f(x,y))G(f(x,y)) = -|x+y|^2$

and  $G(f(x,y)).G(f(x,y)) = |x+y|^2$

From the choices, we observe that:

**Option (a):** LHS of the expression is  $-|x+y|^2$ , which is always non positive. RHS of the expression

is  $|x+y|^2$ , which is always non negative. The only situation when LHS is equal to RHS is when each is equal to zero. Hence, (a) is not necessarily true.

**Option (b):** The given expression can be written as

$$-|x+y|^2 > |x+y|^2 \quad \text{or} \quad 0 > 2|x+y|^2.$$

This implies that  $0 > |x+y|$ , which is not true. Hence, (b) is not true.

**Option (c):**  $F(f(x,y))G(f(x,y)) = -|x+y|^2$

$$\text{and } G(f(x,y)).G(f(x,y)) = |x+y|^2$$

These two expressions can be equal if  $|x+y| = 0$ . Hence, (c) is not necessarily true.

**Option (d):**  $F(f(x,y)) + G(f(x,y)) + f(x,y)$

$$= -|x+y| + |x+y| + |x+y| = |x+y|$$

$$f(-x,-y) = |(-x) + (-y)| = |-x-y| = |-(x+y)| = |x+y|$$

Therefore, the two expressions are equal.

99. c  $f(G(f(1,0)), f(F(f(1,2)), G(f(1,2))))$

$$= f(G(f(1,0)), f(3, -3))$$

$$= f(G(f(1,0)), 0)$$

$$= f(-1, 0) = 1.$$

100. c The option (c) yields  $x^2$ .

$$-F(f(x,x)) \cdot G(f(x,x)) \div \log_2 16$$

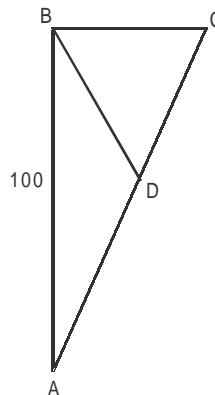
$$= -(-2x \cdot 2x) \div \log_2 16$$

$$= \frac{4x^2}{\log_2 2^4} = x^2$$

101. c The final point is (6, 6). The previous point is (6, 2) and the one before is (4, 2).

102. a Two instructions are needed, one parallel to the X-axis and the other parallel to the Y-axis. i.e. WALKX(-x) and WALKY(-y)

103. b



Since AD = DC, the distance travelled is same for the two stretches.

Hence, the average speed is given by  $\frac{2ab}{(a+b)} =$

$$\frac{(2 \times 45 \times 55)}{(45 + 55)} = 49.5 \text{ kmph.}$$

104. a Now, since X and Y reach C at the same time,

$$\frac{100 + BC}{61.875} = \frac{AC}{49.5}, \text{ Hence, you need to take help from}$$

options. i.e.

If AC = 105, BC<sup>2</sup> = AC<sup>2</sup> - AB<sup>2</sup> = 105<sup>2</sup> - 100<sup>2</sup> = 1025 or BC = 32

$$\text{So, } \frac{100 + BC}{AC} = \frac{132}{105} = 1.25$$

105. b In this triangle, AD = DC = BD =  $\frac{105}{2} = 52.5$  km

(Note: The best way to solve this question is to treat questions 104 and 105 together. You would figure out that the answer to question 105 has to be half of the answer to question 104, and the only pairs of answer choices that fit into this condition are 105 and 52.5)

106. c Distance between A and B = (35 × 2) + (45 × 2) = 160 km.

Distance covered by Aditi in each speed segment

$$= \frac{160}{3}$$

Hence, total petrol consumed

$$= \left( \frac{160}{3} \times \frac{1}{16} \right) + \left( \frac{160}{3} \times \frac{1}{24} \right) + \left( \frac{160}{3} \times \frac{1}{16} \right) = 8.9 \text{ l}$$

107. a For minimum petrol consumption, Zoheb should drive

at 40 kmph, petrol consumption =  $\frac{160}{24} = 6.67$  l.

**For questions 108 to 110:**

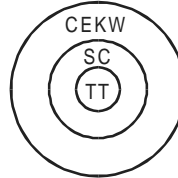
Game	Opening balance	Player's pick		Dealer's pick		Closing balance
		Debit (-)	Credit (+)	Debit (-)	Credit (+)	
1	0	0	8	16	0	-8
2	-8	0	10	0	10	12
3	12	0	6	6	0	12
4	12	0	8	16	0	4

108. a Hence, we see that the maximum gain is Rs. 12

109. b Since the maximum negative that Ghosh Babu goes into is -8, he should begin with at least Rs. 8, so that he does not have to borrow any money at any point.

110. d From the above table it is evident that in four games, Ghosh Babu makes a profit of Rs. 4. Hence, if the final amount left with Ghosh Babu is Rs. 100, the initial amount that he had would be Rs. 96.

111. b (b) ACB is the correct answer choice. as it forms a valid syllogism.



CEKW = Companies that employ knowledge workers

SC = Software companies

TT = Tara Tech

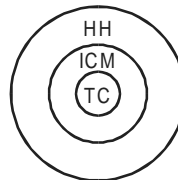
The premises state that all software companies employ knowledge workers and Tara Tech is a software company. Therefore, Tara Tech employs knowledge workers.

(a) ABC is invalid, because if Tara Tech employs knowledge workers, it cannot definitely be concluded that it is a software company.

(c) CDB is invalid, because if only some software companies employ knowledge workers, Tara Tech may not be among them.

(d) ACE introduces a fourth term. 'Companies that employ only knowledge workers' and, therefore, violates the very definition of a syllogism, which must have 3 and only 3 terms.

112. d (d) BAC is the correct answer choice, as it forms a valid syllogism.



TC = Instances of traffic congestion

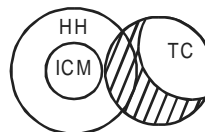
ICM = Instances of increase in carbon monoxide in the environment.

HH = Instances that are hazardous to health.

The premises state that increase in carbon monoxide is hazardous to health and traffic congestion increases carbon monoxide in the environment. Therefore, traffic congestion is hazardous to health.

(a) CBA is invalid, because if TC and ICM are both separately hazardous to health (HH), no definite relationship between TC and ICM necessarily follows.

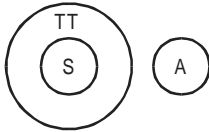
(b) BDE is invalid, because the some TC that are not ICM need not necessarily be free of any hazard to health (HH): they could possibly pollute the environment with other noxious gases.



The shaded portion shows those some TC that are not ICM, but could possibly be hazardous to health (HH).

(c) CDE is invalid, because the conclusion E is a negation of one of the premises C. Another check reveals the TC is the middle term, which appears in both the premises C and D, and E, therefore, should not appear in the conclusion E, as per the basic definition of a syllogism.

113. a (a) CEA is the correct answer choice, as it forms a valid syllogism.



Figures S = Sweets  
TT = Tasty things  
A = Apples

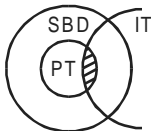
Sweets are a subset of tasty things. Apples are not tasty things. As apples are not a part of the main set of tasty things, they can also not be a part of the subset of sweets.

(b) BDC is invalid, because the set of some A that are S and the set of some A that are not TT may have no relationship with each other (disjoint sets).

(c) CBD is invalid, because some A that are S are definitely TT, but we have no knowledge of the remaining A, and hence can reach no conclusion about them.

(d) EAC is invalid, because if all A are neither S nor TT, we cannot establish a definite relationship between S and TT.

114. b (b) BAE is the correct answer choice, as it forms a valid syllogism.



PT = Polluted towns  
SBD = Things that should be destroyed  
IT = Indian towns or towns in India.

The shaded portion are those IT which are polluted (PT) and hence should be destroyed (SBD).

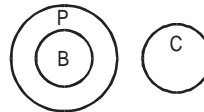
The premises state that polluted towns should be destroyed and that some towns in India are polluted. The 'some' in statement E refers to the polluted Indian towns that should be destroyed.

(a) BDE is invalid, because with B and D as premises, the only valid conclusion that follows is C. Town Meghana should be destroyed. 'Town Meghana' cannot be simply replaced by 'Some town in India,' as in E.

(c) ADE is invalid, because the syllogism has more than 3 terms. The term SBD does not appear in the premises A and D, but appears in the conclusion E as a new and fourth term.

(d) CDB is invalid, because we can't talk of all PT in the conclusion B, when we only have information about Town Meghana in both the premises C and D. In deductive reasoning, we cannot proceed from specific cases to general cases. It would, however, be valid to conclude that 'some polluted towns should be destroyed.'

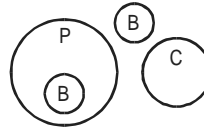
115. a (a) ACB is the correct answer choice, as it forms a valid syllogism.



P = Patriots  
C = Criminals  
B = Bundledas

Since patriot and criminal are two distinct sets, what is patriot, cannot be criminal. Therefore, if Bundledas is a patriot, Bundledas cannot be a criminal.

(b) ABC is invalid, because if no P is C and B is not C, we cannot be definite that B is not P.

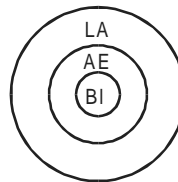


Bundledas (B) may be a patriot (P) or not. Nothing definite can be concluded.

(c) ADE is invalid, on similar lines as explained in the case of (b).

(d) ABE is invalid, because the syllogism has four terms: patriots, criminals, Bundledas and Bogusdas.

116. d (d) ACD is the correct answer choice, as it forms a valid syllogism.

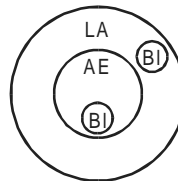


BI = Balaram  
AE = Anteaters  
LA = Creatures who like ants

Anteaters like ants and Balram is an anteater. Therefore, Balram likes ants.

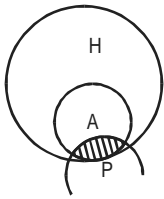
(a) DCA is invalid. Just because Balaram likes ants and he is also an anteater, it does not logically follow that all anteaters like ants. It would, however, be valid to conclude that 'some anteaters like ants.'

(b) ADC is invalid, because if Balaram like ants, we cannot definitely conclude that Balaram is an anteater, as evident from the Venn diagram.



(c) ABC is invalid, because it has four terms: Anteaters, creatures who like ants, boys and Balaram. Furthermore, E: 'Balaram may eat ants' is a tantologous statement and can never feature in a valid syllogism. A 'may' statement implies 'may not' and is always true (tantalogous), and can always stand on its own, without any supporting premises. Hence, such a statement is of no use to a student of logic, who is concerned with the process of reasoning, arriving at a definite conclusion from definite information given in the premises.

117. b (b) ABE is the correct answer choice, as it forms a valid syllogism.



H = Handsome people  
A = Actors  
P = Popular people

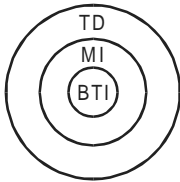
The shaded portion are some popular people who are actors and hence are handsome people.

All actors are handsome and some of those actors are also popular. Therefore, some who are popular are also handsome.

(a) ACD is invalid, as there are four terms: actors, handsome people, Ram and popular actors. Furthermore, just because Ram is handsome does not definitely mean that he is an actor, let alone 'a popular actor'.

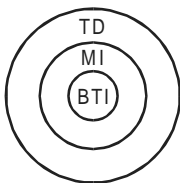
(c) and (d) are similarly invalid as option (a), because they each have four terms.

118. a (a) ABC is the correct answer choice, as it forms a valid syllogism.



BTI = BTI  
MI = Modern Industry  
TD = Thing that is technology-driven.  
All modern industries are technology-driven.  
BTI is a modern industry  
Therefore, BTI is technology-driven.

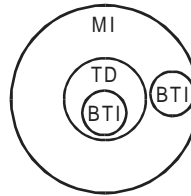
(b) ABD is invalid, although it is similar to the correct option ABC.



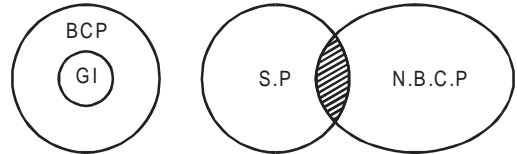
It is invalid simply because the statement D: 'BTI may be technology-driven, is a tautologous statement (that is, it is always true, regardless of what the premises say).

(c) BCA is invalid. Just because BTI is a modern industry and it is technology-driven, it does not mean that all MI are TD. It would, however, be valid to conclude that 'Some MI are TD'.

(d) EBC is invalid, because if BTI is a modern industry, we cannot definitely conclude that it is technology-driven, as evident from the Venn diagram.



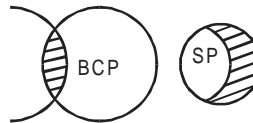
119. b (b) ABE is the correct answer choice, as it forms a valid syllogism.



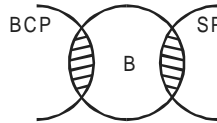
GI = Golmal islanders  
BCP = Blue-coloured people  
SP = Smart people  
NBCP = Not blue-coloured people

Those smart people who are not blue-coloured people (shaded portion) are definitely not Golmal islanders.

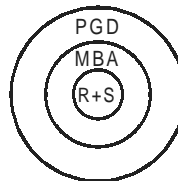
(a) BCD is invalid, because there is no connection between some babies that are BCP and the some SP who are not BCP.



(c) CBD is invalid, because there need not necessarily be any relationship between the some B that are BCP and the some B that are SP.



120. c (c) AEB is the correct answer choice, as it forms a valid syllogism.



R + S = Ram and Sita  
PGD = People in great demand  
MBA = MBA

As all MBAs are in great demand and Ram and Sita belong to the set of MBAs, Ram and Sita are also in great demand.

(a) ABE is invalid because R + S need not be MBAs, just because both are in great demand.

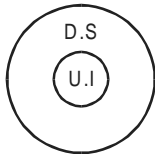
(b) ECD makes no sense.

(d) EBA is invalid. Just because R + S are MBAs and in great demand does not mean that 'all MBAs are in great demand'. It would, however, be valid to conclude the 'some MBAs are in great demand'.

121. d The main statement clearly states that if the orangutan (O) belongs to the set of not angry (NA), he cannot belong to the set of frowns (F). Also, O must belong to either of the two sets.  
CB states that O is not F and is NA. And DA states that O is not NA and is F. Therefore, both CB and DA are logically valid.

122. d The main statement clearly states that Ravana (R) is either a demon (D) or a hero (H). He has to be at least one of the two, and if he is one, he cannot be the other.  
DB states that R is not H but is D.  
And CA states that R is not D but is H.  
Therefore, both DB and CA are logically valid.

123. a The question statement clearly states that whenever Rajeev uses the Internet, he dreams about spiders. However, this does not mean that he dreams about spiders only when he uses the Internet. Therefore, using the Internet is only one possible condition for Rajeev to dream about spiders. Thus, the Venn diagram for the question will be:



Where,

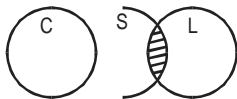
UI → Uses Internet

DS → Dreams of spiders

Answer choice (a) AD states that Rajeev did not dream about spiders, and hence he did not use the Internet. This logically follows the above Venn diagram. If the main set does not occur, the subset will also not occur. Thus, AD is the right option.

124. d P = I talk to my professors  
Q = I do not need to take a pill for headache.  
Therefore, both AB( $P \Rightarrow Q$ ) and CD( $\text{neg } Q \Rightarrow \text{neg } P$ ) are logically consistent, not BA and DC.  
(d) 'AB and CD' is the correct answer choice.

125. c (c) 'A and D' is the correct answer choice



Statement A is valid:

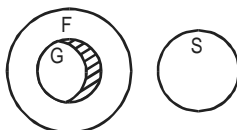
The shaded portion represents those some sphinxes that laugh and, therefore, are not cowboys as no cowboys laugh.

Statement B is invalid.

All G are F.

Some G are not S.

∴ Some S are not F.



F = Florescent things

G = Ghosts

S = Singers

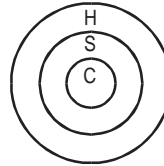
The valid conclusion is: Some F(shared position) are not S. (V) and not the converse: Some S are not F. (X)  
(The some ghosts who are not singers (in shaded portion) are also the 'some florescent things that are not singers')

Statement C is invalid:

All C are S.

All S are H.

∴ Some H are not C.



C = Cricketers

S = Those who swear

H = Those who are hanged

The valid conclusion is:

All C are H (✓) and not its negation: Some H are not (C)

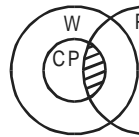
(x)

Statement D is valid.

Some CP are P.

All CP are W.

∴ Some W are P.



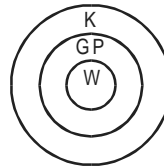
CP = Crazy people

W = Wrestlers

P = Pianists

The shaded portion represents those some pianists who are crazy people and are, therefore, wrestlers. And conversely, they are those some wrestlers who are pianists.

126. a (a) 'C and D' is the correct answer choice.  
Statement A is invalid: The valid conclusion would be 'All W are K', rather than its converse, 'All K are W'.



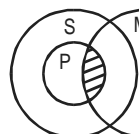
K = Knights

GP = Good People

W = Warriors

Statement B is invalid, because it has four terms: footballers, ministers, tough people and players.

Statement C is valid: The 'some M' that are P are also S. (shaded position).

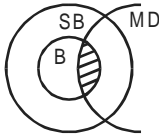


S = Snacks

P = Pizzas

M = Meals

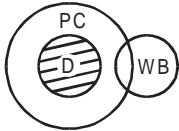
Statement D is valid: The 'some MD' that are B are also SB. (shaded portion).



SB = Sloth bears  
B = Barkers  
MD = Musk deer

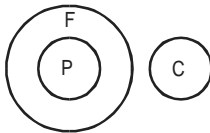
127. b (b) B only is the correct answer choice.

Statement A is invalid, as 'No WB are PC' cannot be validly concluded. What can, however, be validly concluded is that 'Some PC (which are all D in shaded position) are not WB'.



D = Dinosaurs  
PC = Prehistoric creatures  
WB = Water buffaloes

Statement B is valid as evident from the Venn diagram



F = Frank creatures  
P = Politicians  
C = Crocodiles  
P is a subset of F.  
F and C are disjoint sets.

As the main set F can never intersect with C, the subset D will also never intersect or coincide with C. Statement C is invalid: No valid conclusion can follow from two negative premises, as negatives have the effect of separating one term from the others.

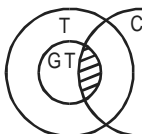
Statement D is invalid, as the 'Some GI Joes' who like bananas need not be monkeys.

128. c (c) 'C and B' is the correct answer choice.

Statement A is invalid because it has four terms:

- Earthquakes
- Things that cause havoc
- Landslides
- Things that cause landslides

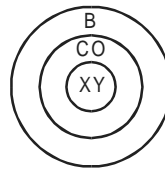
Statement B is valid as the 'Some C' which are GT are also T (shaded portion).



T = Transparent  
GT = Glass things  
C = Curios

As all glass things (GT) are transparent (T), those curios (C) that are GT are definitely T.

Statement C is valid:



B = Brittle things  
CO = Clay objects  
CO is a subset of B.  
XY is a subset of CO.  
Therefore, XY is also a subset of B.  
Thus, all XY are also brittle.  
Statement D is invalid.

No valid conclusion can follow from two negative premises, as negatives have the effect of separating one term from the other.

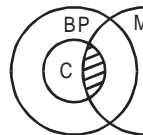
129. b (b) C is the only correct answer choice.

Statement A is invalid.

MD need not necessarily be among the some actors who are pretty.

Statement B is invalid, as the third segment is not a conclusion logically deduced using both the first and second segments. In fact, the conclusion can directly be deduced from the second segment alone. Another way to check for this error is to see whether the middle term 'Cops', that appears in the premises also appears in the conclusion. Here, 'Cops' appears in all three segments and option (b) is therefore, not a valid syllogism.

Statement C is valid. Those 'Some men', who are cops are also brave people (shaded portion).



BP = Brave people  
C = Cops  
M = Men  
C is a subset of BP  
Some M is C.

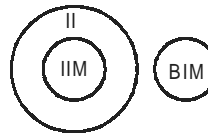
Therefore, those M that are C, are also BP.

Statement D is invalid, MS may still be pretty without being an actor.

130. a (a) 'A and B' is the correct answer choice.

A and B are both valid: 'No IIMs are BIMs' or its converse,

'No BIMs are IIMs' are both equally valid.



II = Institutes in India.  
IIMs is a subset of II.  
No II is a BIM

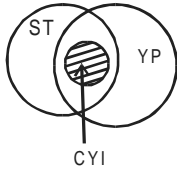
As the mainset II can never intersect with the disjoint set BIM, the subset IIM will also never intersect or coincide with BIM.



C and D are both invalid: The 'Some IIMs' and the 'Some BIMs' need not have any relationship between them, just because they are not in India.

131. c (c) Only C is the correct answer choice.

Statement A is invalid. We cannot conclude about 'all YP', but only about 'Some YP' (shaded portion) who are, incidentally, 'all CYI'.

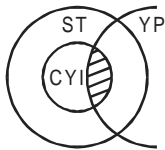


CYI = Citizens of Yes Islands  
ST = People who speak only the truth  
YP = Young people

Statement B is invalid, because it has four terms:

- Citizens of Yes Islands
- People who speak only the truth
- Things that are in the Atlantic
- Yes Islands

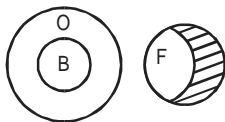
Statement C is valid. The 'Some YP' who are CYI also are people who speak only the truth. (shaded portion)



Statement D is invalid, because the 'some people' and the 'some CYI' need not have any relationship between them, just because both speak only the truth.

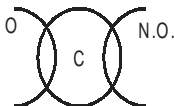
132. c (c) C only is the correct answer choice.

Statement A is invalid, as the some fish that are viviparous need not be mammals.



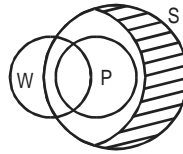
Statement B is invalid. We can validly conclude that the 'Some fish (shaded portion)' that are not oviparous are definitely not birds as well. But, based on this, we cannot conclude that 'Some fish are birds', as we have no knowledge about the 'remaining fish'.

Statement C is valid, as we can validly conclude that the 'Some C' which are inside the circle O cannot be mammals. But nothing definite can be said about the 'Some C' which are outside the circle O.



Statement D is invalid, because the 'Some C', which are V and the 'Some C', which are M, need not have any relationship between them, as evident from the Venn diagram.

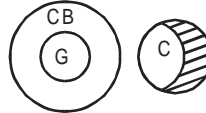
133. b (b) B only is the correct answer choice.



Statement A is invalid, as no definite relationship between P and W can be established.

**Note:** 'Many' is translated as 'Some' to convert the statement in standard form.

The 'Some S (shared portion)' are not W, but some other S could be W, as shown in the Venn diagram above.



Statement B is valid, as the 'Some C (shaded portion)' that do not climb beans stalks cannot be giants.

G = Grants  
C = Children

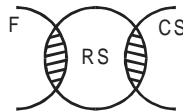
CB = Creatures which climb beanstalks

C is invalid, the 'Some penguins' that live in snowdrifts need not be explorers.

D is invalid, as Amar is the tallest among the three, but it is not clear how the heights of Akbar and Anthony are compared.

**Note:** This is not a 'Categorical' syllogism comprising statements, as such. All S is P, No S is P, Some S is P and some S is not P. It is a 'relational' syllogism comprising relational statements that normally feature in analytical reasoning. Be alert: CAT examiner is in the habit of jumbling up questions to throw you off gear.

134. d (d) 'C and D' is the correct answer choice.

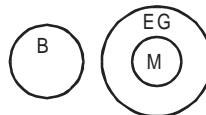


Statement A is invalid: The 'Some F' who are RS and the 'Some RS' who can catch snakes need not have any relationship between them.

CS = People who catch snakes  
RS = Rocket scientists  
F = Farmers

**Note:** 'Many' or 'a few' are both translated as 'some' to convert the statements in the standard form.

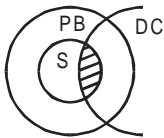
Statement B is invalid. Poonam need not be among the some kangaroos that are made of teak.



Statement C is valid. No matadors can be bulls because the former eat grass, while the latter do not.

EG: Creatures that eat grass  
M: Matadors  
B: Bulls

Statement D is valid. The some PB (shaded portion) are in effect the 'Some skunks' that drive Cadillacs.



DC: Creature that drive Cadillacs  
PB: Polar bears  
S: Skunks

135. a From the graph, we know the percentage growth in sales are:

	Previous sales	Current sales	Difference	Percentage
1995-96	100	250	150	150%
1996-97	250	300	50	20%
1997-98	300	290	-10	-3.33%
1998-99	290	680	390	134.5%

It is but obvious from the above table that the maximum percentage increase relative to previous year occurred in 1995-96.

136. d From the graph, we can again calculate the growth in profits.

	Previous profit	Current profit	Difference	Percentage
1995-96	2.5	4.5	2	80%
1996-97	4.5	6	1.5	33.33%
1997-98	6.0	8.5	2.5	41.66%
1998-99	8.5	12	3.5	41.2%

The highest percentage growth in net profit relative to the previous year was achieved in 1995-96.

137. b

	Net profit	Net sales	Ratio
1994-95	2.5	100	0.025
1995-96	4.5	250	0.02
1996-97	6	300	0.02
1997-98	8.5	290	0.03
1998-99	12	680	0.018

The profitability is maximum for 1997-98.

138. d It may be seen that profitability does not follow a fixed pattern as the first three statements try to generalize the profitability. They are not applicable.

139. c Total trade with a region is defined as: The sum of exports and imports from that region, from the pie charts for 1997-98, we have the following sectors occupying maximum area.

	Country	Exports	Imports	Trade
H	OPEC	3397.9	9379.2	12795.1
I	Asia	6796	5709	12505
G	East Europe	3397	7748	11145.9
C	EU	4757	4893.5	9650.5
A	USA	6456	3670	10126

H – OPEC has the maximum trade.

140. b From the pie chart, the region having lowest trade is K.

1% of imports + 1% of exports

∴ Indian exports are 1% of 3397.9 which is roughly 340 million USD.

141. a

	Imports to India	Exports from India	Trade deficit
A	3670.11	6456.01	-2785.9
B	2038.95	2038.74	0.21
C	4893.48	4757.06	136.42
D	2446.74	2038.74	408
E	2038.95	2038.74	0.21
F	815.58	1019.37	-203.79
G	7748.01	3397.9	4350.11
H	9379.17	3397.9	5981.27
I	5709.06	6795.8	-1086.74
J	1631.16	1698.95	-67.79

So, we see that region H has highest trade deficit of approximately \$6,000 million or \$6 billion.

142. a From the pie chart for 1997-98, we get that USA which is a region A has the lowest trade deficit.

(9% of imports – 19% of total exports)

$$\left( \frac{9}{100} \times 40779 - \frac{19}{100} \times 33979 \right)$$

= \$- 2785.9 million.

143. b From the pie chart, we know that the exports have increased from three regions A, G and H as follows.

	Country	1998-99	1997-98
A	USA	7395.4	6456
G	East European countries	3858.5	3397.9
H	OPEC	3215.4	3397.9

Also the exports for 8 months have been given. According to new directions, before question 143, we need to calculate exports for 12 months

$$\frac{21436 \times 12}{8} = \$32,154 \text{ million.}$$

The maximum percentage increase is therefore from region A.

144. b India's total trade deficits are as follows.

	Imports	Exports	Deficit
1997-98	40779	33979	6800
1998-99	42189	32154	10035

$$\begin{aligned} \text{Total imports for 1998-99} &= \frac{28126 \times 12}{8} \\ &= \$42,189 \text{ millions} \end{aligned}$$

$$\begin{aligned} \text{Similarly, exports for 1998-99} &= \frac{28126 \times 12}{8} \\ &= \$32,154 \text{ millions} \end{aligned}$$

$$\begin{aligned} \text{Percentage growth rate} &= \frac{10035 - 6800}{6800} \times 100 \\ &= 47.6\% \end{aligned}$$

145. a The price changes for each commodity are as follows.

	Ending	Beginning	Difference	Percentage
Arhar	2125	1700	425	25
Pepper	19275	18525	750	4
Sugar	1435	1440	5	-0.3
Gold	3820	4250	330	7.8

The highest price change from the graph and the above is definitely for Arhar.

146. c The price volatility for each individual.

	Highest price	Lowest price	Difference	Average price	PV
Arhar	2300	1500	800	1900	0.42
Pepper	19500	17350	2250	18425	0.12
Sugar	1500	1410	90	1455	0.062
Gold	4300	3800	480	4050	0.12

The price volatility for sugar is least, hence answer choice is (c).

**Note:** Average price can be calculated by highest price, lowest price, ending and beginning price.

147. d Let us assume Mr X invested Rs. 100 in each commodity.

	Price increase percentage	Income on Rs. 100
Arhar	25	25
Pepper	4	4.0
Sugar	-0.3	-0.3
Gold	-7.8	-7.8
		21.5

∴ His income is Rs. 21.5 on Rs. 100.

$$\therefore \frac{21.5}{100} \times 100 = 21.5\% \text{ profit}$$

148. b As per the table in question 146, the maximum PV is around 40%.

149. c Bangladesh has highest drinking water facility and hence can not be dominated by any country. Similarly Philippines has highest sanitation facilities and hence cannot be dominated.

150. b Statement A > Statement B only if statement A has higher percentage in total coverage for both drinking water and sanitation facilities taken independently and not as a total of the two facilities. Thus, only statement B and statement D are India > China (81 > 67 and 29 > 24) India > Nepal (81 > 63 and 29 > 18) Also China > Nepal (67 > 63 and 24 > 18)

151. c Let the urban population be  $x$  and rural population be  $y$ .  
 From the sanitation column, we have  
 $0.7x + 0.14y = 0.29(x + y)$   
 $0.41x = 0.15y$
- $$\therefore x = \frac{15}{41}y$$
- $\therefore$  Percentage of rural population
- $$= \frac{y}{x + y} \times 100$$
- $$= \frac{y}{\frac{15}{41}y + y} \times 100$$
- $$= \frac{41}{56} \times 100$$
- $$= 73.2\%$$

152. a In the same way as the previous questions, we can find percentage of rural population for Philippines, Indonesia and China.

P	50%
I	66.66%
C	79.8%

Thus,  $P < I < C$

153. d India is not on coverage frontier because  
 (i) it is below Bangladesh and Philippines for drinking water.  
 (ii) for sanitation facilities it is below Philippines, Sri Lanka, Indonesia and Pakistan.

**For questions 154 and 155:**

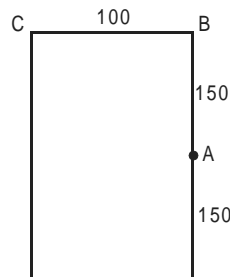
The disparity for the coverage of rural sector is as follows.

	Rural sector	Urban sector
I	65	15
B	52	20
C	49	23
P	47	5
P	20	4
I	22	6
S	-5	20
N	51	30

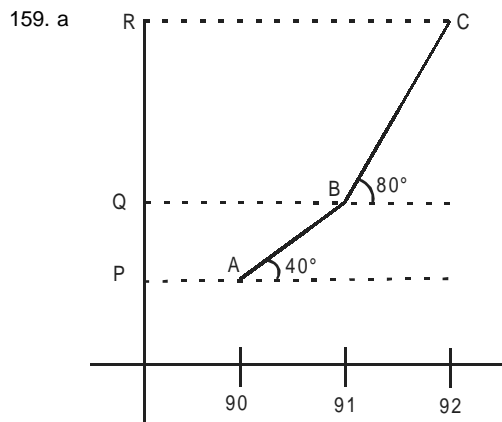
**Note:** Disparity = (Percentage denoting drinking facilities coverage – Percentage denoting sanitation coverage).  
 For example, rural sector of India =  $79 - 14 = 65\%$   
 Thus, as it can be seen from the table, in rural sector the country with most disparity is India ( $79 - 14$ ) =  $65\%$ .  
 And the country with least disparity in urban sector is Philippines ( $92 - 88$ ) =  $4\%$

154. a 155. c

156. d Statement I gives the weight of the heaviest and lightest members of the class but no indication as to the number of students in the class or the total weight of the students is there. The second statement is also inconclusive, making our answer choice as (d).
157. c Statement I gives the thickness of the wall which is of no use to find the volume of the tank since we do not know the radius of the sphere.  
 Statement II gives us the answer as the volume of water displaced is equal to the volume of the immersed tank (from Archimedes' principle)  
 So to find the exact storage volume of the tank both the statements are needed.
158. c Statement I by itself does not solve the problem but it does tell us about the shape of the field. However, it fails to give information about the points A, B and C as to whether they be at the end of the field, etc. This data is given by the second statement, from which it is known that



The polygon has the length =  $150 \times 2 = 300$  m and the breadth =  $100$  m and also that it is a rectangle (from A). Thus, the maximum distance is the diagonal length of the rectangle.



$$\text{Ratio of revenues} = \frac{RQ}{QP}$$

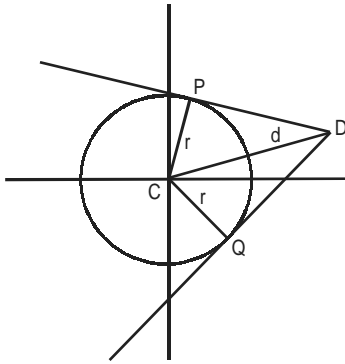
Since in a line graph, the years are uniformly spaced

$$\Rightarrow \frac{RQ}{QP} = \frac{\tan 80^\circ}{\tan 40^\circ}$$

So the ratio can be determined from statement I alone.

Statement II is immaterial because we intend to find the ratio and not absolute figures.

160. b

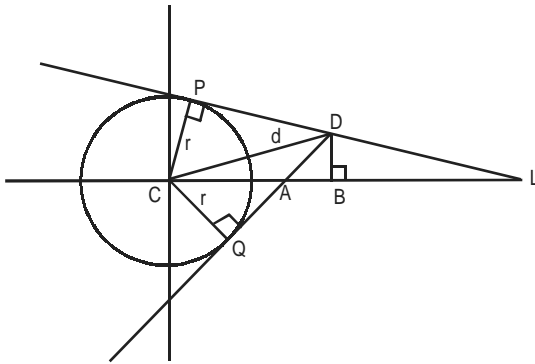


$r$  and  $d$  are given

From **statement I**, when co-ordinates of  $D$  are given, only one pair of tangents can be drawn onto the given circle from  $D$ . So angle made by  $x$ -axis for each can be found out.

Hence, statement I alone is sufficient.

Consider **statement II**. Let the  $x$ -axis bisect the tangent  $QD$ , i.e.  $QA = AD$ .



Here  $QA = \frac{1}{2}QD = \frac{1}{2}\sqrt{d^2 - r^2}$ . So using trigonometric

ratios in right  $\triangle CQA$ , we can determine  $\angle CAQ$ .

Therefore,  $\angle DAB$  is equal to  $\angle CAQ$  (vertically opposite angles).

Consider the other tangent  $DP$ . Let it intersect  $x$ -axis at point  $L$ .

$\angle CDQ$  can be determined using trigonometric ratios

(as two of the sides are given in right  $\triangle CDQ$ ). Also,

$\angle CDQ$  is equal to  $\angle CDP$  (since the two right  $\triangle CQD$  and  $\triangle CPD$  are congruent). Drop a

perpendicular  $DB$  on  $x$ -axis. In right  $\triangle DBL$ , we can

find  $\angle BDL = 180^\circ - (\angle ADB + \angle CDQ + \angle CDP)$

$= 180^\circ - 2\angle CDQ - \angle ADB$ . Applying angle sum property of triangle, we can determine  $\angle DLB$ .

Hence, statement II alone is sufficient.

161. d Statement I when used to solve the sum gives us the same equation as the second substituted in to the first equation.

$$kdx + key = kf$$

$$\therefore k(dx + ey) = kf$$

as  $k \neq 0$ ,  $dx + ey = f$  which is same as second equation. So it is of no use as we get infinite solutions and not a unique one.

Statement II gives us the following equations.

$$x + y = c$$

$$2x + 2y = f.$$

These are two linear equations in  $x$  and  $y$ , such that

$$\frac{1}{2} = \frac{1}{2} \neq \frac{c}{f}$$

As  $\frac{c}{f} \neq \frac{1}{2}$  (Given), the system will have no solution.

As the data given in both the statements is inconsistent, the question cannot be answered.

162. d

A	B	C
1 + 1	1 + 1 + 2	1 + 1
3	3	2

Statement I: As C added up two numbers correctly, he is not a mathematician. However, from the given information, it is not necessary that any person who adds up two numbers incorrectly is a mathematician. Therefore, A or B may or may not be mathematicians. Hence, statement I alone is not sufficient.

Statement II: If a mathematician makes a mistake in a sum, the error is +1 or -1. But it doesn't imply that if a person makes an error of +1 or -1, he is a mathematician.

Hence, statement II alone is not sufficient.

Even on combining the two statements, we cannot conclude anything concrete.

163. c From I, we know A and B passed the examination.

From II, we know the condition that among C and D at least one passed (or both passed) is false.

Therefore, it is obvious that both C and D have failed. Thus, both statements are necessary to find the answer.

164. c **Statement I:** Given that  $x$  satisfies the equation,

$$\log_2 x = \sqrt{x}$$

$$\therefore x = 2^{\sqrt{x}}$$

This equation is satisfied by the values  $x = 4$  and  $16$ . Hence, statement I alone is not sufficient.

**Statement II:** Nothing concrete can be concluded from the fact that  $x \leq 10$  km.

Hence, statement II alone is not sufficient.

**Combining statements I and II**, we get a unique value of  $x = 4$  km.

165. d Statement I gives us the number of white flowers. But we know that a white seed gives both red or white flowers. Thus, proving statement II, gives the number of red flowers. But both black and white seeds give red flowers, again providing no solutions.