CAT 1993 Question Paper

Common Admission Test · Indian Institutes of Management

175 Questions

General Instructions

(i) This paper contains **175 questions** from **CAT 1993**. The original examination was a **paper-based test**.

(ii) The question groups appear in their original sequence: **Verbal Ability** (50 questions); **Quantitative Ability and Data Sufficiency** (50 questions); **Reading Comprehension** (50 questions); **Data Interpretation** (25 questions).

(iii) Each question has **four choices**. Select the single best answer, using the shared passage, table or diagram wherever indicated.

(iv) Read the directions for every question group carefully. Question numbers continue across the paper.

(v) Passages and questions may continue onto the following page. Read each question and all its choices before answering.

Verbal Ability · Questions 1-50

1. 1. India's experience of industrialization is characteristic of the difficulties faced by a newly independent developing country.

A. In 1947, India was undoubtedly an under-developed country with one of the lowest per capita incomes in the world.

B. Indian industrialization was the result of a conscious deliberate policy of growth by an indigenous political elite.

C. Today India ranks fifth in the international comity of nations if measured in terms of purchasing power.

D. Even today however, the benefits of Indian industrialization since independence have not reached the masses.

6. Industrialization in India has been a limited success; one more example of growth without development.

(A) CDAB
(B) DCBA
(C) CABD
(D) BACD

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2. 1. What does the state do in a country where tax is very low?

A. It tries to spy upon the taxpayers.

B. It investigates income sources and spending patterns.

C. Exactly what the tax authority tries to do now even if inconsistently.

D. It could also encourage people to denounce to the tax authorities any conspicuously prosperous neighbours who may be suspected of not paying their taxes properly.

6. The ultimate solution would be an Orwellian System.

(A) BADC
(B) DBAC
(C) ABCD
(D) DCBA

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3. 1. It is significant that one of the most common objections to competition is that it is blind.

A. This is important because in a system of free enterprise based on private property chances are not equal and there is indeed a strong case for reducing the inequality of opportunity.

B. Rather it is a choice between a system where it is the will of few persons that decides who is to get what and one where it depends at least partly, on the ability and the enterprise of the people concerned.

C. Although competition and justice may have little else in common, it is as much a commendation of competition as of justice that it is no respecter of persons.

D. The choice today is not between a system in which everybody will get what he deserves according to some universal standard and one where individuals' shares are determined by chance of goodwill.

6. The fact that opportunities open to the poor in a competitive society are much more restricted than those open to the rich, does not make it less true that in such a society the poor are more free than a person commanding much greater material comfort in a different type of society.

(A) CDBA
(B) DCBA
(C) ABCD
(D) BADC

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4. 1. The fragile Yugoslav state has an uncertain future.

A. Thus, there will surely be chaos and uncertainty if the people fail to settle their differences.

B. Sharp ideological differences already exist in the country.

C. Ethnic, regional, linguistic and material disparities are profound.

D. The country will also lose the excellent reputation it enjoyed in the international arena.

6. At worst, it will once more become vulnerable to international conspiracy and intrigue.

(A) BCAD (B) ADCB

(C) ACBD (D) DBCA

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5. 1. The New Economic Policy comprises the various policy measures and changes introduced since July 1991.

A. There is a common thread running through all these measures.

B. The objective is simple: to improve the efficiency of the system.

C. The regulatory mechanism involving multitude of controls has fragmented the capacity and reduced competition even in the private sector.

D. The thrust of the new policy is towards creating a more competitive environment as a means to improving the productivity and efficiency of the economy.

6. This is to be achieved by removing the banners and restrictions on the entry and growth of firms.

(A) DCAB (B) ABCD

(C) BDAC (D) CDBA

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6. 1. Commercial energy consumption shows an increasing trend and poses the major challenge for the future.

A. The demand for petroleum, during 1996-97 and 2006-07 is anticipated to be 81 million tonnes and 125 million tonnes respectively.

B. According to the projections of the 14th Power Survey Committee Report, the electricity generation requirements from utilities will be about 416 billion units by 1996-97 and 825 billion units by 2006-07.

C. The production of coal should reach 303 million tonnes by 1996-97 to achieve Plan targets and 460 million tonnes by 2006-07.

D. The demand for petroleum products has already outstripped indigenous production.

6. Electricity is going to play a major role in the development of infrastructural facilities.

(A) DACB (B) CADB

(C) BADC (D) ABCD

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7. 1. The necessity for regional integration in South Asia is underlined by the very history of the last 45 years since the liquidation of the British Empire in this part of the world.

A. After the partition of the Indian Subcontinent, Pakistan was formed in that very area which the imperial powers had always marked out as the potential base for operations against the Russian power in Central Asia.

B. Because of the disunity and ill-will among the South Asian neighbours, particularly India and Pakistan, great powers from outside the area could meddle into their affairs and thereby keep neighbours apart.

C. It needs to be added that it was the bountiful supply of sophisticated arms that emboldened Pakistan to go for warlike bellicosity towards India.

D. As a part of the cold war strategy of the US, Pakistan was sucked into Washington's military alliance spreading over the years.

6. Internally too, it was the massive induction of American arms into Pakistan which empowered the military junta of that country to stuff out the civilian

government and destroy democracy in Pakistan.

(A) ACBD
(B) ABDC
(C) CBAD
(D) DCAB

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8. 1. The success of any unit in a competitive environment depends on prudent management sources.

A. In this context it would have been more appropriate if the concept of accelerated depreciation, together with additional incentives towards capital allowances for recouping a portion of the cost of replacements out of the current generations, had been accepted.

B. Added to this are negligible retention of profits because of inadequate capital allowances and artificial disallowance's of genuine outflows.

C. One significant cause for poor generation of surpluses is the high cost of capital and its servicing cost.

D. The lack of a mechanism in India tax laws for quick recovery of capital costs has not received its due attention.

6. While this may apparently look costly from the point of view of the exchequer, the ultimate cost of the Government and the community in the form of losses suffered through poor viability will be prohibitive.

(A) ADBC
(B) BCDA
(C) CBDA
(D) DBAC

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9. 1. Count Rumford is perhaps best known for his observations on the nature of heat.

A. He undertook several experiments in order to test the theories of the origin of frictional heat.

B. According to the calorists, the heat was produced by the “caloric” squeezed out of the chips in the process of separating them from the larger pieces of metal.

C. Lavoisier had introduced the term “caloric” for the weightless substance heat, and had included it among the chemical elements, along with carbon, nitrogen and oxygen.

D. In the munitions factory in Munich, Rumford noticed that a considerable degree of heat developed in a brass gun while it was being bored.

6. Rumford could not believe that the big amount of heat generated could have come from the small amount of dust created.

(A) ABCD
(B) CBDA
(C) ADCB
(D) CDAB

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10. 1. Visual recognition involves storing and retrieving of memories.

A. Psychologists of the Gestalt School maintain that objects are recognised as a whole in a procedure.

B. Neural activity, triggered by the eye, forms an image in the brain's memory system that constitutes an internal representation of the viewed object.

C. Controversy surrounds the question of whether recognition is a single one-step procedure or a serial step-by-step one.

D. When an object is encountered again, it is matched with its internal recognition and thereby recognised.

6. The internal representation is matched with the retinal image in a single operation.

(A) DBAC
(B) DCAB
(C) BDCA
(D) CABD

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11. 1. The idea of sea-floor spreading actually preceded the theory of plate tectonics.

A. The hypothesis was soon substantiated by the discovery that periodic reversals of the earth's magnetic field are recorded in the oceanic crust.

B. In its original version, it described the creation and destruction of ocean floor, but it did not specify rigid lithospheric plates.

C. An explanation of this process devised by F.J. Vine and D.H. Mathews of Princeton is now generally accepted.

D. The sea-floor spreading hypothesis was formulated chiefly by Harry H. Hess of Princeton University in the early 1960's.

6. As magma rises under the mid-ocean, ferromagnetic minerals in the magma become magnetised in the direction of the geomagnetic field.

(A) DCBA
(B) ABDC
(C) CBDA
(D) DBAC

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12. 1. The history of mammals dates back at least to Triassic time.

A. Miocene and Pliocene time was marked by culmination of several groups and continued approach towards modern characters.

B. Development was retarded, however, until the sudden acceleration of evolutional change that occurred in the oldest Paleocene.

C. In the Oligocene Epoch, there was further improvement, with appearance of some new lines and extinction of others.

D. This led in Eocene time to increase in average size, larger mental capacity, and special adaptations for different modes of life.

6. The peak of the career of mammals in variety and average large size was attained in this epoch.

(A) BDCA
(B) ACDB
(C) BCDA
(D) ACBD

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13. 1. The death of cinema has been predicted annually.

A. It hasn't happened.

B. It was said that the television would kill it off and indeed audiences plummeted reaching a low in 1984.

C. Film has enjoyed a renaissance, and audiences are now roughly double of what they were a decade ago.

D. Then the home computer became the projected nemesis, followed by satellite television.

6. Why? Probably because, even in the most atomized of societies, we human beings feel the need to share our fantasies and our excitement.

(A) CADB
(B) BDAC
(C) ABDC
(D) DABC

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14. A. In emission trading, the government fixes the total amount of pollution that is acceptable to maintain a desired level of air quality.

B. Economists argue this approach makes air pollution control more cost-effective than the current practice of fixing air pollution standards and expecting all companies to pollute below these standards.

C. USA uses emission trading to control air pollution.

D. It then distributes emission permits to all companies in the region, which add up to the overall acceptable level of emission.

(A) BADC
(B) ACDB
(C) CADB
(D) DBAC

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15. A. Realists believe that there is an objective reality "out there" independent of ourselves.
B. This reality exists solely by virtue of how the world is, and it is in principle discoverable by application of the methods of science.
C. They believe in the possibility of determining whether or not a theory is indeed really true or false.
D. I think it is fair to say that this is the position to which most working scientists subscribe.

(A) ABCD
(B) CDBA
(C) DCBA
(D) BCAD

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16. A. All levels of demand, whether individual, aggregate, local, national, or international are subject to change.
B. At the same time, science and technology add new dimensions to products, their uses, and the methods used to market them.
C. Aggregate demand fluctuates with changes in the level of business activity, GNP, and national income.
D. The demands of individuals tend to vary with changing needs and rising income.

(A) CBDA
(B) DCAB
(C) BCAD
(D) ADCB

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17. A. There is a strong manufacturing base for a variety of products.
B. India has come a long way on the technology front.
C. But the technology adopted has been largely of foreign origin.
D. There are however areas such as atomic energy, space, agriculture, and defense where significant strides have been made in evolving relevant technologies within the country.

(A) ADCB
(B) DBAC
(C) BACD
(D) CBAD

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18. A. Secret persons shall strike with weapons, fire or poison.
B. Clans mutually supporting each other shall be made to strike at the weak points.
C. He shall destroy their caravans, herds, forests and troop reinforcements.
D. The conqueror shall cause enemy kingdom to be destroyed by neighboring kings, jungle tribes, pretenders or unjustly treated princes.

(A) DCBA
(B) ABCD
(C) BDCA
(D) ADCB

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19. A. The individual companies vary in size, from the corner grocery to the industrial giant.
B. Policies and management methods within firms range from formal well-planned organization and controls to slipshod day-to-day operations.
C. Various industries offer a wide array of products or services through millions of firms largely independent of each other.

D. Variation in the form of ownership contributes to diversity in capital investment, volume of business, and financial structure.

(A) DBCA
(B) CADB
(C) BACD
(D) ADCB

Questions 20 to 23

Read the text and the numbered statements carefully and answer the questions given at the end.

Four people of different nationalities live on the same side of a street in four houses each of different color. Each person has a different favorite drink. The following additional information is also known:

The Englishman lives in the red house.

The Italian drinks tea.

The Norwegian lives in the first house on the left.

In the second house from the right they drink milk.

The Norwegian lives adjacent to the blue house.

The Spaniard drinks fruit juice.

Tea is drunk in the blue house.

The white house is to the right of the red house.

20. The color of the Norwegian's house is

(A) yellow
(B) white
(C) blue
(D) red

21. Milk is drunk by

(A) Norwegian
(B) English
(C) Italian
(D) None of the above

22. The Norwegian drinks

(A) milk
(B) cocoa
(C) tea
(D) fruit juice

23. Which of the following is not true?

(A) Milk is drunk in the red house.
(B) The Italian lives in the blue house.
(C) The Spaniard lives in a corner house.
(D) The Italian lives next to the Spaniard.

Questions 24 to 27

Refer to the following information and answer the questions that follow.

"Kya-Kya" is an island in the South Pacific. The inhabitants of "Kya-Kya" always answer any question with two sentences, one of which is always true and the other always false.

24. You find that your boat is stolen. You question three inhabitants of the island and they reply as follows:

John says, “I didn't do it. Mathew didn't do it.”
Mathew says, “I didn't do it. Krishna didn't do it.”
Krishna says, “I didn't do it. I don't know who did it.”
Who stole your boat?

(A) John
(B) Mathew
(C) Krishna
(D) None of them

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25. There is only one pilot on the island. You interview three men, Koik, Lony and Mirna. You also notice that Koik is wearing a cap.
Mirna says, “Lony's father is the pilot. Lony is not the priest's son.”
Koik says, “I am the priest. On this island, only priests can wear caps.”
Lony says, “I am the priest's son. Koik is not the priest.”
Which of the following is true?

(A) Lony is not Koik's son.
(B) Koik is the pilot.
(C) Mirna is the pilot.
(D) Lony is the priest.

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26. You are walking on the road and come to a fork. You ask the inhabitants Ram, Laxman and Lila, "which road will take me to the village?"
Ram says, “I never speak to strangers, I am new to these parts.”
Laxman says, “I am married to Lila. Take the left road.”
Lila says, “I am married to Ram, He is not new to this place.”
Which of the following is true?

(A) Left road takes you to the village.
(B) Right road takes you to the village.
(C) Lila is married to Laxman.
(D) None of these.

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27. You want to speak to the chief of the village. You question three inhabitants, Amar, Bobby and Charles. Only Bobby's is wearing a red shirt.
Amar says, “I am not Bobby's son. The chief wears a red shirt.”
Bobby says, “I am Amar's father, Charles is the chief.”
Charles says, “The chief is one among us. I am the chief.”
Who is the chief?

(A) Amar
(B) Bobby
(C) Charles
(D) None of them

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28. Each question is a logical sequence of statements with a missing link, the location of which is shown parenthetically. From the four choices available you are required to choose the one which best fits the sequence logically.
28. Many of us live one-eyed lives. We rely largely on the eye of the mind to form our images of reality. It is a mechanical world based on fact and reason. (_____). So today more and more of us are opening the other eye, the eye of the heart, looking for realities to which the mind's eye is blind. This is a world warmed and transformed by the power of love, a vision of community beyond the mind's capacity to see. Either eye alone is not enough. We need “wholesight”, a vision of the world in which mind and heart unite.

(A) It had led to unprecedented scientific growth and material well-being.

(B) In the nuclear age, our mind-made world has been found flawed and dangerous, even lethal.

(C) The question is irrelevant, whether or not they can be seen and reasoned.

(D) We have built our lives based on it because it seemed predictable and safe.

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29. People arguing for a position have been known to cast the opposite in an unnecessarily feeble light. (_____). People who indulge in this fallacy may be fearful or ignorant of a strong counter argument. Detecting this fallacy often depends on having already heard a better refutation, or having information with which to construct one.

(A) Casting the opposite as weaker than it really is, is a very effective strategy.

(B) This portrayal of a refutation as weaker than it really is, is a sure way of proving your point.

(C) Casting the opposite as weaker than it really is, is not a very effective strategy.

(D) This portrayal of refutation as weaker than it really is, is unwarranted.

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30. The question of what rights animals should enjoy is a vexatious one, Hundreds of millions of animals are put to death for human use each year. Contrariwise, it can be argued that slowing down scientific research would retard discovery of antidotes to diseases such as cancer which kill humans and animals alike. (_____). What if super intelligent beings from Alpha Centauri landed on earth and decided to use us for their experiments, arguing that they could save far more of their and our lives by so doing?

(A) It will benefit both in the long run.

(B) Is the argument truly fair to animals?

(C) But the progress of human civilization cannot be made contingent on some hypothetical rights of animals.

(D) There is no question of equating human rights with those of animals.

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31. A deliberation is a form of discussion in which two people begin on different sides of an issue. (_____) Then each decides, in the light of the other argument whether to adopt the other position, to change his or her position somewhat, or to maintain the same position. Both sides realize that to modify one's position is not to lose; the point is to get closer to the truth of the matter.

(A) Each person argues his or her position most sincerely.

(B) The prerequisite for deliberation to be productive is that persons involved must keep an open mind.

(C) The purpose is to resolve the issue to the satisfaction of both parties.

(D) The trick is to state your viewpoint from a position of strength.

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32. Each of these questions has a pair of CAPITALIZED words followed by four pairs of words. Choose the pair of words which best expresses the relationship similar to that expressed in the capitalized pair.

32. BRAND : PRODUCT

(A) Dalda : Rath

(B) Aircraft : Flying Machine

(C) Shoes : Reebok

(D) Sports car : Automobiles

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33. FOOD : GOURMET

(A) Book : Critic
(B) Art : Connoisseur
(C) Sports : Fans
(D) Craft : Skill

34. NORTH : SOUTH

(A) Black : White
(B) Yellow : orange
(C) Red : Maroon
(D) Red : Indigo

35. DROUGHT : FAMINE

(A) Poverty : Plenty
(B) Drip : Fluid
(C) Camera : Film
(D) Training : Skill

36. NUTS : BOLTS

(A) Nitty : Gritty
(B) Bare : Feet
(C) Naked : Clothes
(D) Hard : Soft

37. SALT : SALTY

(A) Sweet : Sugar
(B) Cow : Bovine
(C) Bitter : Sour
(D) Taste : Flavor

38. JUST : ARBITRARY

(A) Order : Chaos
(B) Bare : Clothed
(C) Hope : Surprise
(D) Proper : Impropr

39. CRIME : PUNISHMENT

(A) Lawyer : Judge
(B) Court : Room
(C) Accused : Defendant
(D) Homicide : Penalty

40. ATMOSPHERE : STRATOSPHERE

(A) Nimbus : Cloud
(B) Instrument : Calibration
(C) Aircraft : Jet
(D) Climate : Rain

41. DIVIDE : UNITE

(A) Split : Apart
(B) Marriage : Divorce
(C) Fission : Fusion
(D) Chasm : Gap

42. Each of the following questions has four items. Mark the one that does not belong to this group.
42.

(A) Invoice
(B) Sales Tax
(C) Octroi
(D) Quotation

43.

(A) Equestrian
(B) Neigh
(C) Derby
(D) Bark

44.

(A) Apt
(B) Relevant
(C) Appropriate
(D) Adept

45.

(A) Ring
(B) Shoulder
(C) Finger
(D) Write

46.

(A) Abstract
(B) Conceptual
(C) Material
(D) Idealist

47. Each question is a sentence broken into four parts. Select that part which has an error.
47.

(A) You did not wait
(B) for us before you
(C) went to meet him.
(D) Isn't it?

48.

(A) The police have prevented
(B) Rajan in leaving the
(C) city without informing them
(D) two days in advance.

49.

(A) I would have
(B) given you the
(C) documents yesterday if
(D) you had asked for it.

50.

(A) Who have you
(B) invited for the lecture
(C) on astrophysics
(D) this evening?

Questions 51 to 57

Each of these items has a question followed by two statements. As the answer, Mark (a) if the question can be answered with the help of statement I alone, Mark (b) if the question can be answered with the help of statement II alone, Mark (c) if both statement I and II are needed to answer the question, and Mark (d) if the question cannot be answered even with the help of both the statements.

51. Given that X and Y are non-negative. What is the value of X?

I. $2X + 2Y \leq 40$

II. $X - 2Y \geq 20$

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements I and II together are sufficient, but neither alone is sufficient

(D) The question cannot be answered even with the help of both statements

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52. What are the values of 3 integers a, b, and c?

I. $ab = 8$

II. $bc = 9$

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements I and II together are sufficient, but neither alone is sufficient

(D) The question cannot be answered even with the help of both statements

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53. Is the average of the largest and the smallest of four given numbers greater than the average of the four numbers?

I. The difference between the largest and the second largest numbers is greater than the difference between the second smallest and the smallest numbers.

II. The difference between the largest and the second largest is less than the difference between the second largest and the second smallest numbers.

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements I and II together are sufficient, but neither alone is sufficient

(D) The question cannot be answered even with the help of both statements

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54. What are the ages of the three brothers?

I. The product of their ages is 21.

II. The sum of their ages is not divisible by 3.

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements I and II together are sufficient, but neither alone is sufficient

(D) The question cannot be answered even with the help of both statements

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55. Two types of widgets, namely type A and type B, are produced on a machine. The number of machine hours available per week is 80. How many widgets of type A must be produced?

I. One unit of type A widget requires 2 machine hours and one unit of type B widget requires 4 machine hours.

II. The widget dealer wants supply of at least 10 units of type A widget per week and he would not accept less than 15 units of type B widget.

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements I and II together are sufficient, but neither alone is sufficient

(D) The question cannot be answered even with the help of both statements

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56. What is the area of a regular hexagon?

I. The length of the boundary line of the hexagon is 36 cm.

II. The area of the hexagon is 6 times the area of an equilateral triangle formed on one of the sides.

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements I and II together are sufficient, but neither alone is sufficient

(D) The question cannot be answered even with the help of both statements

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57. What is the price of mangoes per kg?

I. Ten kg of mangoes and two dozens of oranges cost Rs. 252.

II. Two kg of mangoes could be bought in exchange for one dozen oranges.

(A) Statement I alone is sufficient

(B) Statement II alone is sufficient

(C) Both statements I and II together are sufficient, but neither alone is sufficient

(D) The question cannot be answered even with the help of both statements

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58. Choose the appropriate answer choice.

58. Two oranges three bananas and four apples cost Rs. 15. Three oranges, two bananas and one apple cost Rs. 10. I bought 3 oranges, 3 bananas and 3 apples. How much did I pay?

(A) Rs. 10

(B) Rs. 8

(C) Rs 15

(D) Cannot be determined

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59. The rate of increase of the price of sugar is observed to be two percent more than the inflation rate expressed in percentage. The price of sugar, on January 1, 1994, is Rs. 20 per kg. The inflation rate for the years 1994 and 1995 are expected to be 8% each. The expected price of sugar on January 1, 1996 would be

(A) 23.60

(B) 24.00

(C) 24.20

(D) 24.60

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60. An intelligence agency decides on a code of 2 digits selected from 0, 1, 2, ..., 9. But the slip on which the code is hand-written allows confusion between top and bottom, because these are indistinguishable. Thus, for example, the code 91 could be confused with 16. How many codes are there such that there is no possibility of any confusion?

(A) 25
(B) 75
(C) 80
(D) None of these

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61. Suppose one wishes to find distinct positive integers x, y such that (x + y)/xy is also a positive integer. Identify the correct alternative.

(A) This is never possible.

(B) This is possible and the pair (x,y) satisfying the stated condition is unique.

(C) This is possible and there exist more than one but a finite number of ways of choosing the pair (x,y).

(D) This is possible and the pair (x,y) can be chosen in infinite ways.

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62. Given odd positive integers x, y and z which of the following is not necessarily true?

(A) x^2 y^2 z^2 is odd
(B) 3(x^2 + y^3)z^2 is even
(C) 5x + y + z^4 is odd
(D) z^2 (x^4 + y^4)/2 is even

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63. 139 persons have signed up for an elimination tournament. All players are to be paired up for the first round, but because 139 is an odd number one player gets a bye, which promotes him to the second round, without actually playing in the first round. The pairing continues on the next round, with a bye to any player left over. If the schedule is planned so that a minimum number of matches is required to determine the champion, the number of matches which must be played is

(A) 136
(B) 137
(C) 138
(D) 139

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64. There are ten 50 paise coins placed on a table. Six of these show tails four show heads. A coin is chosen at random and flipped over (not tossed). This operation is performed seven times. One of the coins is then covered. Of the remaining nine coins, five show tails and four show heads. The covered coin shows

(A) a head
(B) a tail
(C) more likely a head
(D) more likely a tail

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65. From each of the two given numbers, half the smaller number is subtracted. Of the resulting numbers the larger one is three times as large as the smaller. What is the ratio of the two numbers?

(A) 2 : 1
(B) 3 : 1
(C) 3 : 2
(D) None

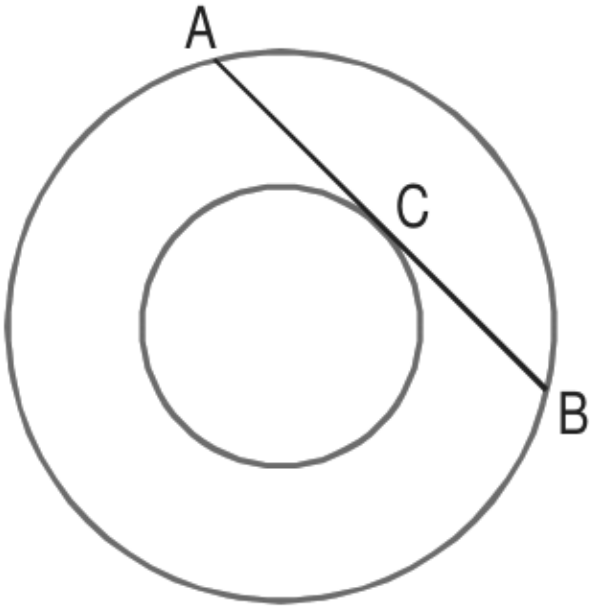
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66. Three identical cones with base radius r are placed on their bases so that each is touching the other two. The radius of the circle drawn through their vertices is

(A) smaller than r.
(B) equal to r.
(C) larger than r.
(D) depends on the height of the cones.

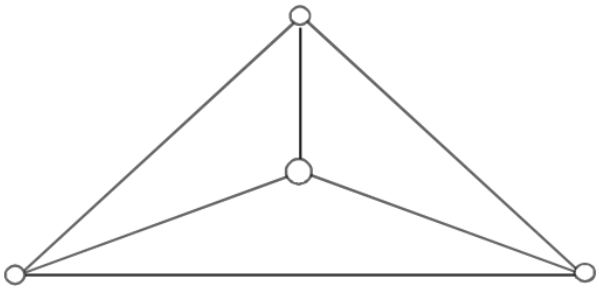
---

67. The line AB is 6 metres in length and is tangent to the inner one of the two concentric circles at point C. It is known that the radii of the two circles are integers. The radius of the outer circle is



(A) 5 metres
(B) 4 metres
(C) 6 metres
(D) 3 metres

68. Four cities are connected by a road network as shown in the figure (a triangle with vertices and a centroid-like point connected to all three vertices). In how many ways can you start from any city and come back to it without travelling on the same road more than once?



(A) 8
(B) 12
(C) 16
(D) 20

Questions 69 to 70

Use the following information: Eighty five children went to an amusement park where they could ride on the merry-go-round, roller coaster, and Ferris wheel. It was known that 20 of them took all three rides, and 55 of them took at least two of the three rides. Each ride cost Re. 1, and the total receipt of the amusement park was Rs. 145.

69. How many children did not try any of the rides?

(A) 5 (B) 10

(C) 15 (D) 20

---

70. How many children took exactly one ride?

(A) 5 (B) 10

(C) 15 (D) 20

---

71. John bought five mangoes and ten oranges together for forty rupees. Subsequently, he returned one mango and got two oranges in exchange. The price of an orange would be

(A) 1 (B) 2

(C) 3 (D) 4

---

72. The number of positive integers not greater than 100, which are not divisible by 2, 3 or 5 is

(A) 26 (B) 18

(C) 31 (D) None

---

73. Let u(n+1) = 2u(n) + 1 (n = 0,1,2,....) and u(0) = 0. Then u(10) nearest to

(A) 1023 (B) 2047

(C) 4095 (D) 8195

Questions 74 to 75

Use the following information: A function f(x) is said to be even if f(-x) = f(x), and odd if f(-x) = -f(x). Thus, for example, the function given by f(x) = x^2 is even, while the function given by f(x) = x^3 is odd. Using this definition, answer the following questions.

74. The function given by f(x) = |x|^3 is

(A) even (B) odd

(C) neither (D) both

---

75. The sum of two odd functions

(A) is always an even function (B) is always an odd function

(C) is sometimes odd and sometimes even (D) may be neither odd nor even

---

76. A five digit number is formed using digits 1, 3, 5, 7 and 9 without repeating any one of them. What is the sum of all such possible numbers?

(A) 6666600 (B) 6666660

(C) 6666666 (D) None

---

77. A box contains 6 red balls, 7 green balls and 5 blue balls. Each ball is of a different size. The probability that the

red ball selected is the smallest red ball, is

(A) 1/18 (B) 1/3

(C) 1/6 (D) 2/3

---

78. Use the following information: ABC forms an equilateral triangle in which B is 2 km from A. A person starts walking from B in a direction parallel to AC and stops when he reaches a point D directly east of C. He, then, reverses direction and walks till he reaches a point E directly south of C.

78. Then D is

(A) 3 km east and 1 km north of A (B) 3 km east and √3 km north of A

(C) √3 km east and 1 km south of A (D) √3 km west and 3 km north of A

---

79. The total distance walked by the person is

(A) 3 km (B) 4 km

(C) 2√3 km (D) 6 km

---

80. A slab of ice 8 inches in length, 11 inches in breadth, and 2 inches thick was melted and resolidified into the form of a rod of 8 inches diameter. The length of such a rod, in inches, is nearest to

(A) 3 (B) 3.5

(C) 4 (D) 4.5

---

81. Let $x < 0.50$, $0 < y < 1$, $z > 1$. Given a set of numbers, the middle number, when they are arranged in ascending order, is called the median. So the median of the numbers x, y, and z would be

(A) less than one (B) between 0 and 1

(C) greater than 1 (D) cannot say

---

82. The maximum possible value of $y = \min(1/2 - 3x\hat{}2/4, 5x\hat{}2/4)$ for the range $0 < x < 1$ is

(A) 1/3 (B) 1/2

(C) 5/27 (D) 5/16

---

83. A group of workers was put on a job. From the second day onwards, one worker was withdrawn each day. The job was finished when the last worker was withdrawn. Had no worker been withdrawn at any stage, the group would have finished the job in two-thirds the time. How many workers were there in the group?

(A) 2 (B) 3

(C) 5 (D) 11

---

84. Consider the five points comprising of the vertices of a square and the intersection point of its diagonals. How many triangles can be formed using these points?

(A) 4 (B) 6

(C) 8 (D) 10

---

85. Out of 100 families in the neighbourhood, 45 own radios, 75 have TVs, 25 have VCRs. Only 10 families have all three and each VCR owner also has a TV. If 25

families have radio only, how many have only TV?

(A) 30 (B) 35

(C) 40 (D) 45

86. Use the following information: The following functions have been defined for three numbers A, B and C: @(A,B) = average of A and B; *(A,B) = product of A and B; /(A,B) = A divided by B. Answer these questions with the above data.

86. If A = 2 and B = 4, the value of @(/(*(A,B),B),A) would be

(A) 2 (B) 4

(C) 6 (D) 16

87. The sum of A and B is given by

(A) *(@(A,B),2) (B) /(@(A,B),2)

(C) @(*(A,B),2) (D) @(/(A,B),2)

88. The sum of A, B, and C is given by

(A) *(@(*(@(B,A),2),C),3) (B) /(@(*(@(B,A),3),C),2)

(C) /(*(@(*(B,A),2),C),3) (D) None of these

89. A report consists of 20 sheets each of 55 lines and each such line consist of 65 characters. This report is retyped into sheets each of 65 lines such that each line consists of 70 characters. The percentage reduction in number of sheets is closest to

(A) 20 (B) 5

(C) 30 (D) 35

90. Let $x < 0$, $0 < y < 1$, $z > 1$. Which of the following may be false?

(A) (x^2 − z^2) has to be positive. (B) yz can be less than one.

(C) xy can never be zero. (D) (y^2 − z^2) is always negative.

91. A young girl counted in the following way on the fingers of her left hand. She started calling the thumb 1, the index finger 2, middle finger 3, ring finger 4, little finger 5, then reversed direction, calling the ring finger 6, middle finger 7, index finger 8, thumb 9, then back to the index finger for 10, middle finger for 11, and so on. She counted up to 1994. She ended on her.

(A) thumb (B) index finger

(C) middle finger (D) ring finger

Questions 92 to 94

Use the following information: Q started to move from point B towards point A exactly an hour after P started from A in the opposite direction. Q's speed was twice that of P. When P had covered one-sixth of the distance between the points A and B, Q had also covered the same distance.

92. The point where P and Q would meet is

(A) Closer to A (B) Exactly between A and B

(C) Closer to B
(D) P and Q will not meet at all

93. How many hours would P take to reach B?

(A) 2
(B) 5
(C) 6
(D) 12

94. How many more hours would P (compared to Q) take to complete his journey?

(A) 4
(B) 5
(C) 6
(D) 7

95. The smallest number which when divided by 4, 6 or 7 leaves a remainder of 2, is

(A) 44
(B) 62
(C) 80
(D) 86

96. The diameter of a hollow cone is equal to the diameter of a spherical ball. If the ball is placed at the base of the cone, what portion of the ball will be outside the cone?

(A) 50%
(B) less than 50%
(C) more than 50%
(D) 100%

97. A ship leaves on a long voyage. When it is 18 miles from the shore, a seaplane, whose speed is ten times that of the ship, is sent to deliver mail. How far from the shore does the seaplane catch up with the ship?

(A) 24 miles
(B) 25 miles
(C) 22 miles
(D) 20 miles

98. The product of all integers from 1 to 100 will have the following numbers of zeros at the end.

(A) 20
(B) 24
(C) 19
(D) 22

99. Let x, y and z be distinct positive integers satisfying $x < y < z$ and $x + y + z = k$. What is the smallest value of K that does not determine x, y, z uniquely?

(A) 9
(B) 6
(C) 7
(D) 8

100. Amar, Akbar, and Anthony came from the same public school in the Himalayas. Every boy in that school either fishes for trout or plays frisbee. All fishermen like snow while no frisbee player likes rain. Amar dislikes whatever Akbar likes and likes whatever Akbar dislikes. Akbar likes rain and snow. Anthony likes whatever the other two like. Who is a fisherman but not a frisbee player?

(A) Amar
(B) Akbar
(C) Anthony
(D) None

Questions 101 to 109

Passage 1: Emile Durkheim, the first person to be formally recognized as a sociologist and the most scientific of the pioneers, conducted a study that stands as a research model for sociologists today. His investigation of suicide was, in fact, the first sociological study to use statistics. In Suicide (1964, originally published in 1897) Durkheim documented his contention that some aspects of human behaviour, even something as allegedly individualistic as suicide, can be explained without reference to individuals.

Like all of Durkheim's work, Suicide must be viewed within the context of his concern for social integration. Durkheim wanted to see if suicide rates within a social entity (for example, a group, organization, or society) are related to the degree to which individuals are socially involved (integrated and regulated). Durkheim describes three types of suicide: egoistic, anomic, and altruistic. Egoistic suicide is promoted when individuals do not have sufficient social ties. Since single (never married) adults, for example, are not heavily involved with family life, they are more likely to commit suicide than are married adults. Altruistic suicide, on the other hand, is more likely to occur when social integration is too strong. The ritual suicide of Hindu widows on their husbands' funeral pyres is one example. Military personnel, trained to lay down their lives for their country, provide another illustration.

Durkheim's third type of suicide, anomic suicide, increases when the social regulation of individuals is disrupted. For example, suicide rates increase during economic depressions. People who suddenly find themselves without a job or without hope of finding one are more prone to kill themselves. Suicides may also increase during periods of prosperity. People may loosen their social ties by taking new jobs, moving to new communities, or finding new mates.

Using data from the government population reports of several countries (much of it from the French Government Statistical Office), Durkheim found strong support for his line of reasoning. Suicide rates were higher among single than married people, among military personnel than civilians, among divorced than married people, and among people involved in nationwide economic crises.

It is important to realize that Durkheim's primary interest was not in the empirical (observational) indicators he used, such as suicide rates among military personnel, married people, and so forth. Rather, Durkheim used the following indicators to support several of his contentions: (1) Social behaviour can be explained by social rather than psychological factors; (2) suicide is affected by the degree of integration and regulation within social entities; and (3) since society can be studied scientifically, sociology is worthy of recognition in the academic world. Durkheim was successful on all three counts.

101. Higher suicide rate during rapid progress in a society is a manifestation of

(A) altruistic suicide.
(B) anomic suicide.
(C) egoistic suicide.
(D) None of the above.

102. In his study of suicide Durkheim's main purpose was

(A) to document that suicide can be explained without reference to the individual.
(B) to provide an explanation of the variation in the rate of suicide across societies.
(C) to categorize various types of suicides.

(D) to document that social behavior can be explained by social rather than psychological factors.

103. Increase in the suicide rate during economic depression is an example of

(A) altruistic suicide.
(B) anomic suicide.
(C) egoistic suicide.
(D) Both a and c.

104. Single adults not heavily involved with family life are more likely to commit suicide. Durkheim categorized this as

(A) anomic suicide.
(B) altruistic suicide.
(C) egoistic suicide.
(D) Both (b) and (c)

105. According to Durkheim, suicide rates within a social entity can be explained in terms of

(A) absence of social ties.
(B) disruption of social regulation.
(C) nature of social integration.
(D) All of the above.

106. According to Durkheim, altruistic suicide is more likely among

(A) military personnel than among civilians.
(B) single people than among married people.
(C) divorcees than among married people.
(D) people involved in nationwide economic crises.

107. Basing himself on his own indicators, Durkheim was

(A) right on some counts, not others.
(B) vindicated on all counts.
(C) wrong but did not realize that he was right.
(D) substantially correct but formally wrong.

108. To support his contentions, Durkheim relied on the following indicators

(A) social behaviour is explicable predominantly through social factors.
(B) suicide is contingent upon the degree of regulation and interaction.
(C) recognizing sociology is to acknowledge that society is susceptible to scientific investigation.
(D) All of the above.

109. Ritual suicide of Hindu widows on their husband's funeral pyres is

(A) a manifestation of strong social integration.
(B) an example of brutality against women.
(C) an example of anomic suicide.
(D) an example of egoistic suicide.

Questions 110 to 118

Passage 2: How quickly things change in the technology business! A decade ago, IBM was the awesome and undisputed king of the computer trade, universally feared and respected. A decade ago, two little companies called Intel and Microsoft were mere blips on the radar screen of the industry, upstart start-ups that had signed on to make the chips and software for IBM's new line of personal computers. Though their products soon became industry standards, the two companies remained protected children of the market leader.

What happened since is a startling reversal of fortune. IBM is being ravaged by the worst crisis in the company's 79 year history. It is undergoing its fifth restructuring in the past seven years as well as seemingly endless rounds of job cuts and firings that have eliminated 100,000 jobs since 1985. Last week IBM announced to its shell-shocked investors that it lost $4.97 billion last year, the biggest loss in American corporate history.

And just when IBM is losing ground in one market after another, Intel and Microsoft have emerged as the computer industry's most fearsome pair of competitors. The numbers on Wall Street tell a stunning story. Ten years ago, the market value of the stock of Intel and Microsoft combined amounted to about a tenth of IBM's. Last week, with IBM's stock at an 11-year low, Microsoft's value surpassed its old mentor's for the first time ever ($26.76 billion to $26.48 billion) and Intel ($24.3 billion) is not far behind. While IBM is posting losses, Intel's profits jumped 30% and Microsoft's rose 44%.

Both Intel, the world's largest supplier of computer chips, and Microsoft, the world's largest supplier of computer software, have assumed the role long played by Big Blue as the industry's pacesetter. What is taking place is a generational shift unprecedented in the information age, one recalls a transition in the US auto industry 70 years ago, when Alfred Sloan's upstart General Motors surpassed Ford Motor as America's No. 1 car maker. The transition also reflects the decline of computer manufacturers such as IBM, Wang and Unisys and the rise of companies like Microsoft, Intel and AT&T that create the chips and software to make the computers work. "Just like Dr. Frankenstein, IBM created these two monster competitors," says Richard Shaffer, publisher of the Computer Letter. "Now even IBM is in danger of being trampled by the creations it unleashed."

Although Intel and Microsoft still have close relationships with Big Blue, there is little love lost between IBM and its potent progeny. IBM had an ugly falling-out with former partner Microsoft over the future of personal-computer software. Microsoft developed the now famous disk operating system for IBM-PC, called DOS, and later created the operating software for the next generation of IBM personal computers, the Personal System/2. When PS/2 and its operating system, OS/2, failed to catch on, a feud erupted over how the two companies would upgrade the system. Although they publicly patched things up, the partnership was tattered. IBM developed its own version of OS/2, which has so far failed to capture the industry's imagination. Microsoft's competing version, dubbed New Technology, or NT, will debut in a few months and will incorporate Microsoft's highly successful Windows program, which lets users juggle several programs at once. Windows NT, however, will offer more new features, such as the ability to link many computers together in a network and to safeguard them against unauthorized use.

IBM and Intel have also been parting company. After relying almost exclusively on the Santa Clara, California company for the silicon chips that serve as computer brains, IBM has moved to reduce its dependence on Intel by turning to competing vendors. In Europe, IBM last year began selling a low-cost line of PCs called Ambra, which runs on chips made by Intel rival Advanced Micro Devices. IBM also demonstrated a sample PC using a chip made by another Intel enemy, Cyrix. And that October IBM said it would begin selling the company's own chips to outsiders in direct competition with Intel.

IBM clearly feels threatened. And the wounded giant still poses the biggest threat to any further dominance by Intel and Microsoft. Last year, it teamed up with both companies' most bitter rivals, Apple Computer and Motorola, to develop advanced software and microprocessors for a new generation of desktop computers. In selecting Apple and Motorola, IBM bypassed its longtime partners. Just as Microsoft's standard operating system runs only on computers built around Intel's computer chips, Apple's software runs only on Motorola's chips. Although IBM has pledged that the new

system will eventually run on a variety of machines, it will initially run only computer programs written for Apple's Macintosh or IBM's OS/2. Its competitive juices now flowing, IBM last week announced that it and Apple Computer will deliver the operating system in 1994, a year ahead of schedule.

110. As a result of greater competition in the US Computer industry

(A) some computer companies are expanding while others are contracting.

(B) employment in the industry is going down.

(C) the industry is becoming more monopolized.

(D) the share value of IBM is going up relative to that of Intel and Microsoft.

---

111. Which of the following statements is not implied by the passage?

(A) The markets of microchips and software are becoming leaders in the computer industry.

(B) Wang and Unisys are primarily manufacturers of computers.

(C) IBM laid off workers in the biggest job cut in American corporate history.

(D) Intel is based in California.

---

112. The personal computer called Ambra is marketed by

(A) Cyrix.

(B) IBM.

(C) Intel.

(D) Microsoft.

---

113. Why is something that happened 70 years ago in the US auto industry being mentioned here?

(A) General Motors broke away from Ford Motors.

(B) A new company went ahead of an established market leader.

(C) Like Dr. Frankenstein, Ford Motor created a monster in General Motors.

(D) Microsoft, Intel and AT&T were originally created by IBM.

---

114. Who is mentioned as the principal supplier of silicon chips to IBM?

(A) AT&T.

(B) Microsoft.

(C) Cyrix.

(D) Intel.

---

115. One possible conclusion from the passage is that

(A) share prices are not a good indicator of a company's performance.

(B) firing workers restores a company's health.

(C) all companies ultimately regret being a Dr. Frankenstein to some other company.

(D) consumers gain as a result of competition among producers.

---

116. Which of the following statements is true?

(A) IBM plans to introduce a new system that will run on a variety of machines.

(B) IBM's new generation desktop computers will run only on Motorola's chips.

(C) IBM is working out a joint strategy with Apple to force Motorola to supply chips at a lower price.

(D) IBM is going to sell its own chips to Apple and Motorola.

---

117. Many computers will be linked together through a network in a system developed by

(A) IBM.

(B) Apple.

(C) Microsoft.

(D) None of the above.

---

118. What was the original reason for the feud between IBM and Microsoft?

(A) The two companies developed competing software.

(B) Microsoft and Intel teamed up against IBM.

(C) IBM began to purchase microchips from Intel instead of Microsoft.

(D) IBM made losses while Microsoft made profits.

Questions 119 to 128

Passage 3: Environmental protection and management is deservedly attracting a lot of attention these days. This is a desirable development in the face of the alarming rate of natural resource degradation which greatly hampers their optimal utilization. When waste waters emanating from municipal sewage, industrial effluent, agriculture and land runoffs, find their way either to ground water reservoirs or other surface water sources, the quality of water deteriorates, rendering it unfit for use. The natural balance is disturbed when concentrated discharges of waste water are not controlled. This is because the cleansing forces of nature cannot do their job in proportion to the production of filthy matter.

According to the National Environment Engineering and Research Institute (NEERI), a staggering 70 percent of water available in the country is polluted. According to the Planning Commission, "From the Dal lake in the North to the Chaliyar river in the South, from Damodar and Hoogly in the East to the Thane Creek in the West, the picture of water pollution is uniformly gloomy. Even our large perennial rivers, like the Ganga, are today heavily polluted."

According to one study, all the 14 major rivers of India are highly polluted. Besides the Ganga, these rivers include the Yamuna, Narmada, Godavari, Krishna and Cauvery. These rivers carry 85 percent of the surface runoff and their drainage basins cover 73 percent of the country. The pollution of the much revered Ganga is due in particular to municipal sewage that accounts for three-fourths of its pollution load. Despite India having legislation on water pollution (The Water (Prevention and Control of Pollution) Act, 1974) and various water pollution control boards, rivers have today become synonymous with drains and sewers.

Untreated community wastes discharged into water courses from human settlements account for four times as much waste water as industrial effluent. Out of India's 3,119 towns and cities, only 217 have partial (209) or full (8) sewerage treatment facilities and cover less than a third of the urban population. Statistics from a report of the Central Board for Prevention and Control of Water Pollution reveal that 1,700 of 2,700 water using industries in India are polluting the water around their factories. Only 160 industries have waste water treatment plants. One estimate suggests that the volume of waste water of industrial origin will be comparable to that of domestic sewage in India by 2000 AD. Discharges from agricultural fields, which carry fertilizing ingredients of nitrogen, phosphorous and pesticides, are expected to be three times as much as domestic sewage. By that date, thermal pollution generated by discharges from

thermal power plants will be the largest in volume.

Toxic effluents deplete the levels of oxygen in the rivers, endanger all aquatic life and render water absolutely unfit for human consumption, apart from affecting industrial production. Sometimes these effects have been disastrous. A recent study reveals that the waters of the Ganga, Yamuna, Kali and Hindon rivers have considerable concentrations of heavy metals due to inflow of industrial wastes, which pose a serious health hazard to the millions living on their banks. Similarly, the Cauvery and Kapila rivers in Karnataka have been found to contain metal pollutants, which threaten the health of people in riverine towns. The Periyar, the largest river of Kerala, receives extremely toxic effluent that results in a high incidence of skin problems and fish kills. The Godavari of Andhra Pradesh and the Damodar and Hoogly in West Bengal receive untreated industrial toxic wastes. A high level of pollution has been found in the Yamuna, while the Chambal of Rajasthan is considered the most polluted river in Rajasthan. Even in industrially backward Orissa, the Rushikula river is extremely polluted. The fate of the Krishna in Andhra Pradesh, the Tungabhadra in Karnataka, the Chaliyar in Kerala, the Gomti in U.P., the Narmada in M.P. and the Sone and Subarnarekha rivers in Bihar is no different.

According to the W.H.O., eighty percent of diseases prevalent in India are water-borne; many of them assume epidemic proportions. The prevalence of these diseases heightens under conditions of drought. It is also estimated that India loses as many as 73 million man-days every year due to water borne diseases, costing Rs. 600 crore by way of treatment expenditure and production losses. Management of water resources with respect to their quality also assumes greater importance especially when the country can no more afford to waste water.

The recent Clean-the-Ganga Project with an action plan estimated to cost the exchequer Rs. 250 crore (which has been accorded top priority) is a trend setter in achieving this goal. The action plan evoked such great interest that offers of assistance have been received from France, UK, US and the Netherlands as also the World Bank. This is indeed laudable. Poland too has now joined this list. The very fact that these countries have volunteered to contribute their mite is a healthy reflection of global concern over growing environmental degradation and the readiness of the international community to participate in what is a truly formidable task. It may be recalled that the task of cleansing the Ganga along the Rishikesh-Hardwar stretch under the first phase of the Ganga Action Plan has been completed and the results are reported to be encouraging.

The reasons for the crisis of drinking water are the drying up and lowering of ground water through overpumping; this is compounded by the pollution of water sources. All these factors increase the magnitude of the problem. An assessment of the progress achieved by the end of March 1985, on completion of the first phase of the International Drinking Water Supply and Sanitation Decade (1981-'91), reveals that drinking water has been available to 73 percent of the urban population and 56 percent of the rural population only. This means that nearly half the country's rural population has yet to get drinking water facilities. This needs to be urgently geared up, especially when considered against the Government's professed objective of providing safe drinking water and sanitation to all by the end of the International Drinking Water Supply and Sanitation Decade, i.e. March 1991. The foremost action in this would be to clean up our water resources.

As per surveys conducted by NEERI, per capita drinking water losses in different cities in the country range between 11,000 to 31,000 litres annually. This indicates a waste level of 20 to 35 percent of the total flow of water in the distribution system, primarily due to leaks in mains and household service pipes. A preventive maintenance programme would substantially reduce losses and wastage, and would certainly go a long way in solving the problem.

According to the Union Ministry of Works and Housing, of the 2.31 lakh problem villages, most have

been provided with at least one source of drinking water as of March 1986. The balance (38,748) villages are expected to be covered during the seventh plan. A time bound national policy on drinking water is being formulated by the Government, wherein the task is proposed to be completed by the end of the seventh plan. An outlay of Rs. 6,522.47 crore has been allotted for the water supply and sanitation sector in the seventh plan period against an outlay of Rs. 3,922.02 crore in the sixth plan. Of this, the outlay for the rural water supply sector is Rs. 3,454.47 crore. It is expected that this outlay would help to cover about 86.4 percent of the urban and 82.2 percent of the rural population with safe drinking water facilities by March 1991. Hygienic sanitation facilities would be provided to 44.7 percent and 1.8 percent of the urban and rural population respectively within the same period.

119. According to NEERI

(A) the extent of water pollution in the Dal Lake is grim.

(B) 70 percent of the total water available in the country is polluted.

(C) only 217 out of 3119 towns and cities have sewage treatment facilities.

(D) all the 14 major rivers of India are highly polluted.

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120. The degradation of natural resources will necessarily lead to

(A) poor economic utilization of resources.

(B) contamination of water from municipal sewage.

(C) water unfit for human consumption.

(D) none of the above.

---

121. Which of the following statements has/have been made by the W.H.O?

(A) Water-borne diseases account for 80 percent of all diseases prevalent in India.

(B) Water-borne diseases in India create a loss of Rs. 600 crores every year.

(C) Both (a) and (b).

(D) None of the above.

---

122. Which of the following statements is correct?

(A) The river Periyar is in South India.

(B) The river Periyar is the largest river of Kerala.

(C) The river Gomti is also extremely polluted.

(D) All of the above are correct.

---

123. Municipal sewage pollutants account for

(A) the lowest percentage of water pollution.

(B) 75 percent of the Ganga's water pollution load.

(C) twice the volume of the waste water of industrial origin.

(D) three times as much as the discharge from agricultural fields.

---

124. The crisis of drinking water is caused chiefly by

(A) the green house effect.

(B) water pollution caused by industrial development.

(C) drying up of water sources and over pumping.

(D) increasing urbanization.

---

125. The cost of the 'Clean-the-Ganga Pollution' Project Action Plan is likely to be sourced from

(A) the Indian exchequer.

(B) France, UK, US and the Netherlands.

(C) the World Bank, Poland, UK.

(D) the US, UK, Netherlands, Poland, France, the World Bank and India.

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126. Considerable amounts of metal pollutants are found in the river(s)

(A) Chambal of Rajasthan.

(B) Rushikula in Orissa.

(C) Damodar, Hoogly, Krishna and Gomti.

(D) Ganga, Yamuna, Kali, Hindon, Cauvery and Kapila.

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127. Out of the total outlay for water supply and sanitation in the seventh plan, the rural water supply sector would receive

(A) about 53 percent.

(B) over 80 percent.

(C) between 65 to 80 percent.

(D) equal to 44.7 percent.

---

128. The best remedy for the shortage lies in

(A) putting up more pumps in rural areas.

(B) cleaning up polluted water.

(C) reducing the waste level of 25-30 percent of the total flow of water.

(D) constructing large sized dams.

Questions 129 to 138

Passage 4: To teach is to create a space in which obedience to truth is practiced. Space may sound a vague, poetic metaphor until we realize that it describes experiences of everyday life. We know what it means to be in a green and open field; we know what it means to be on a crowded rush hour bus. These experiences of physical space have parallels in our relations with others. On our jobs we know what it is to be pressed and crowded, our working space diminished by the urgency of deadlines and competitiveness of colleagues. But then there are times when deadlines disappear and colleagues co-operate, when everyone has a space to move, invent and produce with energy and enthusiasm. With family and friends, we know how it feels to have unreasonable demands placed upon us, to be boxed in by the expectations of those nearest to us. But then there are times when we feel accepted for who we are (or forgiven for who we are not), times when a spouse or a child or a friend gives us the space, both to be and to become.

Similar experiences of crowding and space are found in education. To sit in a class where the teacher stuffs our minds with information, organizes it with finality, insists on having the answers while being utterly uninterested in our views, and focuses us into a grim competition for grades, to sit in

such a class is to experience a lack of space for learning. But to study with a teacher, who not only speaks but also listens, who not only answers but asks questions and welcomes our insights, who provides information and theories that do not close doors but open new ones, who encourages students to help each other learn, to study with such a teacher is to know the power of a learning space.

A learning space has three essential dimensions: openness, boundaries and an air of hospitality. To create open learning space is to remove the impediments to learning that we find around and within us; we often create them ourselves to evade the challenge of truth and transformation. One source of such impediments is our fear of appearing ignorant to others or to ourselves. The openness of a space is created by the firmness of its boundaries. A learning space cannot extend indefinitely; if it did, it would not be a structure for learning but an invitation for confusion and chaos. When space boundaries are violated, the quality of space suffers. The teacher who wants to create an open learning space must define and defend its boundaries with care. Because the pursuit of truth can be painful and discomforting, the learning space must be hospitable. Hospitable means receiving each other, our struggles, our new-born ideas with openness and care. It means creating an ethos in which the community of truth can form and the pain of its transformation be borne. A learning space needs to be hospitable not to make learning painless, but to make painful things possible, things without which no learning can occur, things like exposing ignorance, testing tentative hypotheses, challenging false or partial information, and mutual criticism of thought.

The task of creating learning space with qualities of openness, boundaries and hospitality can be approached at several levels. The most basic level is the physical arrangement of the classroom. Consider the traditional classroom setting with rows of chairs facing the lectern, where learning space is confined to the narrow alley of attention between each student and teacher. In this space, there is no community of truth, no hospitality, no room for students to relate to the thoughts of each other. Contrast it with chairs placed in a circular arrangement, creating an open space within which learners can interconnect. At another level, the teacher can create conceptual space, space with words, in two ways. One is through assigned reading; the other is through lecturing. Assigned reading, not in the form of speed reading several hundred pages but contemplative reading, opens rather than fills our learning space. A teacher can also create a learning space by means of lectures. By providing critical information and a framework of interpretation, a lecturer can lay down boundaries within which learning occurs.

We also create learning space through the kind of speech we utter and the silence from which true speech emanates. Speech is a precious gift and a vital tool, but too often our speaking is an evasion of truth, a way of buttressing our self-serving reconstructions of reality. Silence must therefore be an integral part of learning space. In silence, more than in argument, our mind-made world falls away and we are open to the truth that seeks us. Words often divide us, but silence can unite. Finally, teachers must also create emotional space in the classroom, space that allows feelings to arise and be dealt with, because submerged feelings can undermine learning. In an emotionally honest learning space, one created by a teacher who does not fear dealing with feelings, the community of truth can flourish between us and we can flourish in it.

129. The task of creating learning space with qualities of openness, boundaries and hospitality is multi-dimensional. It involves operating at

(A) psychological and conceptual levels.

(B) physical, perceptual and behavioral levels.

(C) physical, conceptual and emotional levels.

(D) conceptual, verbal and sensitive levels.

130. The statement 'the openness of a space is created by the firmness of its boundaries' appears contradictory. Which of the following statements provides the best justification for the proposition?

(A) We cannot have a space without boundaries.

(B) Bounded space is highly structured.

(C) When space boundaries are violated, the quality of space suffers.

(D) A teacher can effectively defend a learning space without boundaries.

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131. According to the author, learning is a painful process because

(A) it exposes our ignorance.

(B) our views and hypotheses are challenged.

(C) it involves criticizing the views of others.

(D) All of the above reasons.

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132. Understanding the notion of space in our relations with others is

(A) to acknowledge the beauty of a poetic metaphor.

(B) exclusively rooted in our experiences of physical space.

(C) to accept a spiritual dimension in our dealings with our peers.

(D) to extend the parallel of physical space to our experiences in daily life.

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133. Which of the following statements best describes the author's conception of learning space?

(A) Where the teacher is friendly.

(B) Where there is no grim competition for grades.

(C) Where the students are encouraged to learn about space.

(D) Where the teacher provides information and theories which open new doors and encourages students to help each other learn.

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134. According to the author, silence must be an integral part of learning space because

(A) silence helps to unite us with others to create a community of truth.

(B) silent contemplation prepares us to construct our mind-made world.

(C) speaking is too often an exercise in the evasion of truth.

(D) speaking is too often a way of buttressing our self-serving reconstruction of reality.

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135. Another way of describing the author's notion of learning space can be summarized in the following manner

(A) It is vital that learning be accompanied by unlearning.

(B) Learning encompasses such elements as courage, dignity and endeavour.

(C) An effective teacher recognizes the value of empathy.

(D) Encourage good learners, discourage indifferent ones.

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136. According to the author, an effective teacher does not allow

(A) feelings to arise within the learning space.

(B) silence to become an integral part of the learning space.

(C) learning space to be filled by speed reading of several hundred pages of assigned reading.

(D) violation of learning space boundaries.

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137. An emotionally honest learning space can only be created by

(A) a teacher committed to joining the community of truth.

(B) a teacher who is not afraid of confronting feelings.

(C) a teacher who takes care not to undermine the learning process.

(D) a teacher who worships critical silence.

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138. Conceptual space with words can be created by

(A) assigned reading and lecturing.

(B) speed reading and written comprehension.

(C) gentle persuasion and deliberate action.

(D) creative extrapolation and illustrations.

Questions 139 to 150

Passage 5: Management education gained new academic stature within US Universities and greater respect from outside during the 1960's and 1970's. Some observers attribute the competitive superiority of US corporations to the quality of business education. In 1978, a management professor, Herbert A. Simon of Carnegie Mellon University, won the Nobel Prize in economics for his work in decision theory. And the popularity of business education continued to grow; since 1960, the number of master's degrees awarded annually has grown from under 5,000 to over 50,000 in the mid 1980's as the MBA has become known as 'the passport to the good life'.

By the 1980's, however, US business schools faced critics who charged that learning had little relevance to real business problems. Some went so far as to blame business schools for the decline in US competitiveness.

Amidst the criticisms, four distinct arguments may be discerned. The first is that business schools must be either unnecessary or deleterious because Japan does so well without them. Underlying this argument is the idea that management ability cannot be taught; one is either born with it or must acquire it over years of practical experience. A second argument is that business schools are overly academic and theoretical. They teach quantitative models that have little application to real world problems. Third, they give inadequate attention to shop floor issues, to production processes and to management resources. Finally, it is argued that they encourage undesirable attitudes in students, such as placing value on the short term and 'bottom line' targets, while neglecting longer term development criteria. In summary, some business executives complain that MBAs are incapable of handling day to day operational decisions, unable to communicate and to motivate people, and unwilling to accept responsibility for following through on implementation plans. We shall analyze these criticisms after having reviewed experiences in other countries.

In contrast to the expansion and development of business education in the United States and more recently in Europe, Japanese business schools graduate no more than two hundred MBAs each year. The Keio Business School (KBS) was the only graduate school of management in the entire country until the mid 1970's and it still boasts the only two year masters programme. The absence of business schools in Japan would appear in contradiction with the high priority placed upon learning by its Confucian culture. Confucian colleges taught administrative skills as early as 1630 and Japan wholeheartedly accepted Western learning following the Meiji restoration of 1868 when hundreds of students were dispatched to universities in the US, Germany, England and France to learn the secrets

of western technology and modernization. Moreover, the Japanese educational system is highly developed and intensely competitive and can be credited for raising the literary and mathematical abilities of the Japanese to the highest level in the world.

Until recently, Japanese corporations have not been interested in using either local or foreign business schools for the development of their future executives. Their in-company training programs have sought the socialization of newcomers, the younger the better. The training is highly specific and those who receive it have neither the capacity nor the incentive to quit. The prevailing belief, says Imai, 'is that management should be born out of experience and many years of effort and not learnt from educational institutions.' A 1960 survey of Japanese senior executives confirmed that a majority (54%) believed that managerial capabilities can be attained only on the job and not in universities.

However, this view seems to be changing: the same survey revealed that even as early as 1960, 37% of senior executives felt that universities should teach integrated professional management. In the 1980's a combination of increased competitive pressures and greater multi-nationalisation of Japanese business are making it difficult for many companies to rely solely upon internally trained managers. This has led to a rapid growth of local business programmes and a greater use of American MBA programmes. In 1982-83, the Japanese comprised the largest single group of foreign students at Wharton, where they not only learnt the latest techniques of financial analysis, but also developed worldwide contacts through their classmates and became Americanized, something highly useful in future negotiations. The Japanese, then, do not 'do without' business schools, as is sometimes contended. But the process of selecting and orienting new graduates, even MBAs, into corporations is radically different than in the US. Rather than being placed in highly paying staff positions, new Japanese recruits are assigned responsibility for operational and even menial tasks. Success is based upon Japan's system of highly competitive recruitment and intensive in-company management development, which in turn are grounded in its tradition of universal and rigorous academic education, life-long employment and strong group identification.

The harmony among these traditional elements has made Japanese industry highly productive and given corporate leadership a long term view. It is true that this has been achieved without much attention to university business education, but extraordinary attention has been devoted to the development of managerial skills, both within the company and through participation in programmes sponsored by the Productivity Center and other similar organizations.

139. The author argues that the Japanese system

(A) is better than the American system.

(B) is highly productive and gives corporate leadership a long term view as a result of its strong traditions.

(C) is slowly becoming Americanized.

(D) succeeds without business schools, whereas the US system fails because of it.

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140. The growth of popularity of business schools among students was most probably due to

(A) Herbert A. Simon, a management professor, winning the Nobel Prize in economics.

(B) the gain in academic stature.

(C) the large number of MBA degrees awarded.

(D) a perception that it was a 'passport to good life'.

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141. According to the passage

(A) learning, which was useful in the 1960's and 1970's, became irrelevant in the 1980's.

(B) management education faced criticisms in the 1980's.

(C) business schools are insensitive to the needs of industry.

(D) by the 1980's business schools contributed to the decline in US competitiveness.

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142. A criticism that management education did not face was that

(A) it imparted poor quantitative skills to MBAs.

(B) it was unnecessary and deleterious.

(C) it was irrevocably irrelevant.

(D) it inculcated undesirable attitudes in students.

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143. The absence of business schools in Japan

(A) is due to the prevalent belief that management ability can only be acquired over years of practical experience.

(B) was due to the high priority placed on learning as opposed to doing in Confucian culture.

(C) is hard to explain for the proponents of business education.

(D) contributed a great deal to their success in international trade and business.

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144. The 1960's and 1970's can best be described as a period

(A) when quality business education contributed to the superiority of US corporations.

(B) when the number of MBAs rose from under 5,000 to over 50,000.

(C) when management education gained new academic stature and greater respect.

(D) when the MBA became more disreputable.

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145. US business schools faced criticism in the 1980's because

(A) of the decline in Japanese competitiveness.

(B) many critics felt the learning had little relevance to business problems.

(C) people realized that management ability cannot be taught.

(D) MBAs were unwilling to accept responsibility for implementation on the shop floor.

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146. Training programmes in Japanese corporations have

(A) been based upon Confucian culture.

(B) sought the socialization of newcomers.

(C) been targeted at people who have neither the capacity nor the incentive to quit.

(D) been teaching people to do menial tasks.

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147. The Japanese modified their views on management education because of

(A) greater exposure to US MBA programmes.

(B) the need to develop worldwide contacts and become Americanized.

(C) the outstanding success of business schools in the US during the 1960's and 1970's.

(D) a combination of increased competitive pressures and greater multi-nationalisation of Japanese business.

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148. The Japanese were initially able to do without business schools as a result of

(A) their highly developed and intensively competitive education system.

(B) dispatching hundreds of students to learn Western technology and modernization.

(C) their highly specific in-company training programmes.

(D) prevailing beliefs regarding educational institutions.

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149. The main difference between US and Japanese corporations is

(A) that one employs MBAs, the other does not.

(B) that US corporations do not employ Japanese people.

(C) that US corporations pay more to fresh recruits.

(D) in the process of selecting and orienting new recruits.

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150. The author argues that

(A) Japanese do not do without business schools as is generally perceived.

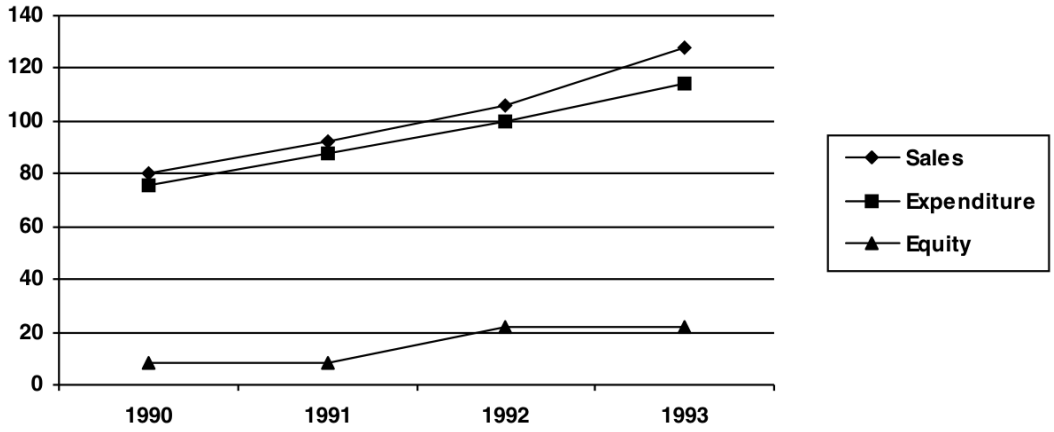
(B) Japanese corporations do not hire MBAs because of traditions of universal and rigorous academic education, life long employment and strong group identification.

(C) placing MBAs in operational and menial tasks is a major factor in Japanese business success.

(D) US corporations should emulate the Japanese and change the way new recruits are inducted.

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151. **Q151 to 154:** Study the graph below (Sales, Expenditure and Equity, in Rs. lakh, for the years 1990, 1991, 1992 and 1993) and answer the questions that follow. Profit is defined as Sales minus Expenditure.



In which year is the profit per rupee of equity the highest?

(A) 1991
(B) 1992
(C) 1993
(D) 1990 and 1991

152. The simple annual growth rate in sales was the highest between the years

(A) 1990-91
(B) 1991-92
(C) 1992-93
(D) 1990-92

153. In which year is the sales per rupee of expenditure the lowest?

(A) 1990
(B) 1991
(C) 1992
(D) 1993

154. In which year is sales per rupee of equity the highest?

(A) 1990
(B) 1991
(C) 1992
(D) 1994

Questions 155 to 158

Q155 to 158: Ghosh Babu has recently acquired four companies namely Arc-Net Technologies (ANT), Babu Anta Transport (BAT), Charles Anter Tailor (CAT) and Daud Akbar Transistors (DAT). When the results of the companies for the year 1992-93 were placed before him, he found a few interesting things about them. While the profits of CAT and DAT were the same, the sales of CAT were the same as those of BAT. Profits of ANT were 10% of its sales, whereas the profits of BAT were 20% of its sales. While the total expenses of CAT were 5 times its profits, sales of DAT were 3 times its profits. The total expenses of CAT were Rs. 10,00,000, and the total expenses of ANT were 10% less than those of CAT. Profits are defined as the difference between sales and total expenses.

155. Which company had the lowest sales?

(A) ANT (B) BAT

(C) CAT (D) DAT

156. Which company had the highest total expenses?

(A) ANT (B) BAT

(C) CAT (D) DAT

157. Which company had the lowest profits?

(A) ANT (B) BAT

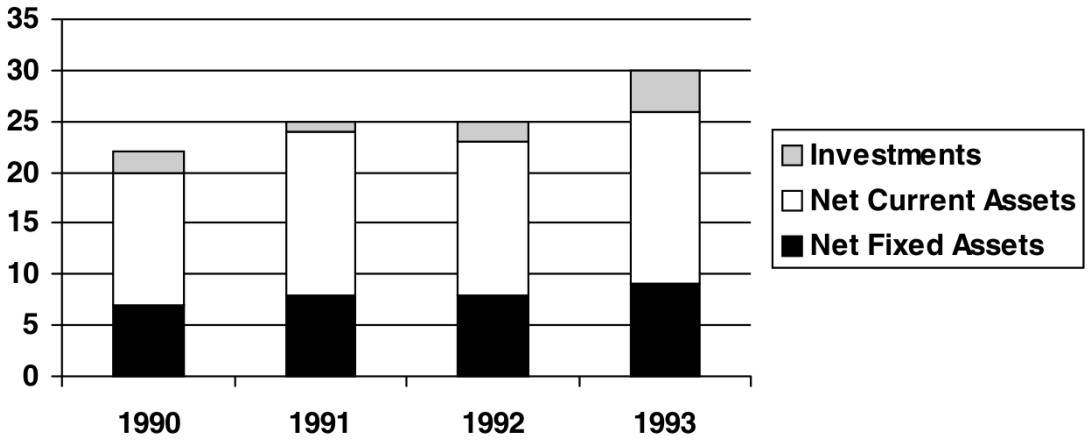
(C) CAT (D) DAT

158. Which company had the highest profits?

(A) ANT (B) BAT

(C) CAT (D) DAT

159. **Q159 to 162:** Study the graph below (Net Fixed Assets, Net Current Assets and Investments, in Rs. lakh, for the years 1990, 1991, 1992 and 1993) and answer the questions that follow. Total Assets are defined as Net Fixed Assets + Net Current Assets + Investments.



What is the approximate simple annual growth rate of Total Assets between 1990 and 1993?

(A) 36% (B) 12%

(C) 9% (D) 27%

160. In any two consecutive years, the growth rate is lowest for

(A) Net Fixed Assets. (B) Net Current Assets.

(C) Investments. (D) Total Assets.

161. Between 1991 and 1992, the highest growth rate was seen for

(A) Net Fixed Assets. (B) Net Current Assets.

(C) Investments. (D) Total Assets.

162. The only item which has not shown a negative growth in every year between 1990 and 1993 is

(A) Net Fixed Assets.
(B) Net Current Assets.
(C) Investments.
(D) Total Assets.

Questions 163 to 166

Q163 to 166: Swetha, Swarna, Sneha and Soumya are four sisters who have an agreement that they share all snacks equally among themselves. One day, uncle Prem gave a box of cookies to Swetha. Since the other sisters were not around, Swetha divided the cookies into four parts, ate her share and put the rest into the box. As she was closing the box, Swarna came in. She took all the cookies from the box and divided them into four equal parts. Swetha and Swarna ate one part each and put the rest into the box. Just then Sneha walked in. She took all the cookies from the box, divided them into four equal parts. The three of them ate their respective shares and put the rest into the box. Later, when Soumya came, she divided all the cookies into four equal parts and all the four sisters ate their respective shares. In total, Soumya ate 3 cookies.

163. How many cookies, in total, did Sneha eat?

(A) 30
(B) 12
(C) 15
(D) 6

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164. How many cookies did uncle Prem give to Swetha?

(A) 128
(B) 156
(C) 256
(D) 192

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165. How many cookies, in total, did Swetha eat?

(A) 32
(B) 142
(C) 72
(D) 71

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166. How many cookies, in total, did Swarna eat?

(A) 9
(B) 30
(C) 39
(D) 78

Questions 167 to 171

Q167 to 171: A professor keeps data on students tabulated by performance and sex of the student. The data is kept on a computer disk, but unfortunately some of it is lost because of a virus. Only the following could be recovered:

	Average	**Good**	**Excellent**	**Total**
Male				10
Female				32
Total	30			

Panic buttons were pressed but to no avail. An expert committee was formed, which decided that the following facts were self evident: Half the students were either excellent or good. 40% of the students were females. One third of the male students were average.

167. How many students were both female and excellent?

(A) 0 (B) 8

(C) 16 (D) 32

168. How many students are both male and good?

(A) 10 (B) 16

(C) 22 (D) 48

169. Among average students, what is the ratio of male to female?

(A) 1:2 (B) 2:1

(C) 3:2 (D) 2:3

170. What proportion of female students are good?

(A) 0 (B) 0.25

(C) 0.5 (D) 1.0

171. What proportion of good students are male?

(A) 0 (B) 0.73

(C) 0.4 (D) 1.0

Questions 172 to 175

Q172 to 175: Given below are the forecasts of the World and Asian energy demand for the years 1990, 2000 and 2010 AD. The demand is given in million barrels per day, crude oil equivalent.

Fuel	1990 World	1990 Asia	2000 World	2000 Asia	2010 World	2010 Asia
Petroleum	50.0	4.0	70.0	10.0	80.0	15.0
Natural Gas	30.0	0.5	40.0	2.5	50.0	5.0
Solid Fuels	50.0	4.0	60.0	5.0	75.0	10.0
Nuclear	10.0	0.5	20.0	1.0	25.0	1.3
Hydropower	10.0	1.0	10.0	1.5	20.0	2.0
Total	150.0	10.0	200.0	20.0	250.0	33.3

172. Over 1990-2010, which two fuels meet more than 60 percent of the total energy demand of both World and Asia?

(A) Petroleum & Natural Gas (B) Petroleum & Solid Fuels

(C) Natural Gas & Solid Fuels (D) None of the above

173. Which fuel's proportion in the total energy demand increases over the decade 1990-2000 and decreases over the decade 2000-2010 for both the World and Asia?

(A) Petroleum (B) Natural Gas

(C) Solid Fuels (D) Nuclear

174. Which is the fuel whose proportion in the total energy demand will decrease continuously over the period 1990-2010, in Asia?

(A) Natural Gas
(B) Solid Fuels
(C) Nuclear
(D) Hydropower

175. Which is the fuel whose proportion to the total energy demand of the world will remain constant over the period 1990-2010 but whose proportion will increase in the total energy demand in Asia?

(A) Solid Fuels
(B) Nuclear
(C) Hydropower
(D) Natural Gas

- End of Question Paper -