

**Question  
Paper with  
Solutions**

**CAT  
1994**





8. A. But instead you are faced with another huge crag and the weary trail continues.  
 B. No, the path wind on and another mountain bars your way.  
 C. When for days you have been going through a mountain pass, a moment comes when you are sure that after winding around the great mass of rock in front of you, you will come upon the plain.  
 D. Surely after this you will see the plain.
- (a) CDBA                      (b) BADC                      (c) CADB                      (d) BCAD
9. A. During one exhibition, however, some air became mixed with the hydrogen, and in the words of the shaken performer: "The explosion was so dreadful that I imagined all my teeth had been blown out!"  
 B. An entertainer would finish his acts by blowing the hydrogen he had inhaled towards a lighted candle; as the hydrogen caught fire, flames would shoot menacingly from his lips.  
 C. A paper bag filled with hydrogen amazed guests by zooming off into space.  
 D. When people learned about its unique lighter-than-air property, they began to use it in all sorts of parlor stunts.
- (a) DCBA                      (b) DBAC                      (c) CABD                      (d) ACBD
10. A. It is exciting and various.  
 B. I am a writer as I might have been a doctor or a lawyer.  
 C. The writer is free to work in what he believes.  
 D. It is so pleasant a profession that it not surprising if a vast number of persons adopt it who have no qualifications for it.
- (a) CADB                      (b) ABDC                      (c) DBCA                      (d) BDAC

**Q11 – 15: four statements with blanks have been given. These statements are followed by four alternatives. Choose the one which fits into the set of statements the maximum number of times.**

11. A. Professional studies has become the\_\_\_\_\_of the rich.  
 B. Every citizen has the\_\_\_\_\_to speak, travel and live as he pleases.  
 C. He has a definite\_\_\_\_\_over all his rivals.  
 D. Sheron no longer has the\_\_\_\_\_of the company's bungalow and car.
- (a) advantage                      (b) privilege                      (c) right                      (d) concession
12. A. People sensed\_\_\_\_\_  
 B. A bad\_\_\_\_\_case had come in – a person with a smashed arm.  
 C. And then, without warning,\_\_\_\_\_struck.  
 D. The dogs were the first to recognize the signs of oncoming\_\_\_\_\_.
- (a) tragedy                      (b) accident                      (c) disaster                      (d) calamity



20. A. he can only renew himself if his soul  
B. he renews himself and  
C. the writer can only be fertile if  
D. is constantly enriched by fresh experience
- (a) CBAD                      (b) CADB                      (c) BDCA                      (d) BACD
21. A. but a masterpiece is  
B. untaught genius  
C. a laborious career than as the lucky fluke of  
D. more likely to come as the culminating point of
- (a) CDAB                      (b) ADCB                      (c) CDBA                      (d) ACDB
22. A. what interests you is the way in which you have a created the illusion  
B. they are angry with you, for it was  
C. the public is easily disillusioned and then  
D. the illusion they loved; they do not understand that
- (a) ACBD                      (b) BDCA                      (c) CBDA                      (d) BCAD
23. A. an adequate physical and social infrastructure level  
B. the pattern of spatial growth in these towns as also to  
C. the failure of the government to ensure  
D. the roots of the riots are related to
- (a) ACBD                      (b) DBCA                      (c) ABDC                      (d) CBDA

**Q24 - 30 : Fill in the blanks of the following sentences using one from the words, idioms or phrases provided in the four alternatives.**

24. One dark night a Darvesh \_\_\_\_\_ passing by a dry well.  
(a) wasn't                      (b) happened to be                      (c) discovered in                      (d) found to
25. Nordisk have recently \_\_\_\_\_ a product called Glucometer.  
(a) started                      (b) commissioned                      (c) launched                      (d) begun
26. I had already published a novel and it was an unexpected success. I thought my \_\_\_\_\_.  
(a) days were up                      (b) chances were good  
(c) ladyluck was happy                      (d) fortune was made
27. The neighbour grabbed the boy, and rolled him on the road to \_\_\_\_\_ the flames.  
(a) smother                      (b) kill                      (c) burn out                      (d) fizz out
28. Sam asked me to keep his secret \_\_\_\_\_.  
(a) secret                      (b) in myself                      (c) amongst us                      (d) between us
29. Sometimes the greatest inventions \_\_\_\_\_ an idea of starting simplicity  
(a) stumbles upon                      (b) hinge upon                      (c) starves without                      (d) lacks







47. A. No plane is a chain.  
B. All manes are chains.  
C. No mane is a plane.  
D. Some manes are not planes.  
E. Some planes are manes.  
F. Some chains are not planes.

(a) ACD

(b) ADF

(c) ABC

(d) CDF

48. A. All dolls are nice.  
B. All toys are nice.  
C. All toys are dolls.  
D. Some toys are nice.  
E. Some nice things are dolls.  
F. No doll is nice.

(a) CDE

(b) CEF

(c) ACD

(d) BEF

49. A. Some buildings are not sky-scrapers.  
B. Some sky-scrapers are not buildings.  
C. No structure is a sky-scraper.  
D. All sky-scrapers are structures.  
E. Some sky-scrapers are buildings.  
F. Some structures are not buildings.

(a) ACE

(b) BDF

(c) CDE

(d) ACF

50. A. All bins are buckets.  
B. No bucket is a basket.  
C. No bin is a basket.  
D. Some baskets are buckets.  
E. Some bins are baskets.  
F. No basket is a bin.

(a) BDE

(b) ACB

(c) CDF

(d) ABF

## Section – II

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### Q51 – 90 : Choose the best alternative.

51. The number of votes not cast for the Praja Party increased by 25% in the National General Election over those not cast for it in the previous Assembly Polls, and the Praja Party lost by a majority twice as large as that by which it had won the Assembly Polls. If a total 2,60,000 people voted each time. How many voted for the Praja Party in the Assembly Elections.
- (a) 1,10,000                      (b) 1,50,000                      (c) 1,40,000                      (d) 1,20,000

### Q52 – 54 : are based on the following information:

Ghoshbabu is staying at Ghosh Housing Society, Aghosh Colony, Dighospur, Calcutta. In Ghosh Housing Society 6 persons read daily Ganashakti and 4 read Anand Bazar Patrika; in his colony there is no person who reads both. Total number of persons who read these two newspapers in Aghosh Colony and Dighospur is 52 and 200 respectively. Number of persons who read Ganashakti in Aghosh Colony and Dighospur is 33 and 121 respectively; while the persons who read Anand Bazar Patrika in Aghosh Colony and Dighospur are 32 and 117 respectively.

52. Number of persons in Dighospur who read only Ganashakti is
- (a) 121                      (b) 83                      (c) 79                      (d) 127
53. Number of persons in Aghosh Colony who read both of these newspapers is
- (a) 13                      (b) 20                      (c) 19                      (d) 14
54. Number of persons in Aghosh Colony who read only one paper
- (a) 29                      (b) 19                      (c) 39                      (d) 20
55. If  $\log_7 \log_5 (\sqrt{x+5} + \sqrt{x}) = 0$ , find the value of  $x$ .
- (a) 1                      (b) 0                      (c) 2                      (d) None of these
56. A right circular cone, a right circular cylinder and a hemisphere, all have the same radius, and the heights of the cone and cylinder equal to their diameters. Then their volumes are proportional, respectively to
- (a) 1 : 3 : 1                      (b) 2 : 1 : 3                      (c) 3 : 2 : 1                      (d) 1 : 2 : 3
57. Two towns A and B are 100 km apart. A school is to be built for 100 students of town B and 30 students of Town A. Expenditure on transport is Rs. 1.20 per km per student. If the total expenditure on transport by all 130 students is to be as small as possible, then the school should be built at
- (a) 33 km from Town A.                      (b) 33 km from Town B  
(c) Town A                      (d) Town B

58. One man can do as much work in one day as a woman can do in 2 days. A child does one third the work in a day as a woman. If an estate-owner hires 39 pairs of hands, men, women and children in the ratio 6 : 5 : 2 and pays them in all Rs. 1113 at the end of the days work. What must the daily wages of a child be, if the wages are proportional to the amount of work done?  
 (a) Rs.14 (b) Rs.5 (c) Rs.20 (d) Rs.7
59. A right circular cone of height  $h$  is cut by a plane parallel to the base and at a distance  $h/3$  from the base, then the volumes of the resulting cone and the frustum are in the ratio  
 (a) 1 : 3 (b) 8 : 19 (c) 1 : 4 (d) 1 : 7
60. If  $a + b + c = 0$ , where  $a \neq b \neq c$ , then  $\frac{a^2}{2a^2 + bc} + \frac{b^2}{2b^2 + ac} + \frac{c^2}{2c^2 + ab}$  is equal to  
 (a) zero (b) 1 (c) -1 (d)  $abc$
61. If the harmonic mean between two positive numbers is to their geometric mean as 12 : 13; then the numbers could be in the ratio  
 (a) 12 : 13 (b) 1/12 : 1/13 (c) 4 : 9 (d) 2 : 3
62. If one root of  $x^2 - 7 + 12 = 0$  is 4, while the equation  $x^2 - 7x + q = 0$  has equal roots, then the value of  $q$  is  
 (a)  $\frac{49}{4}$  (b)  $\frac{4}{49}$  (c) 4 (d)  $\frac{1}{4}$

**Q63 – 64 : are based on the following information:**

If  $md(x) = x$ , |

$mn(x, y) =$  minimum of  $x$  and  $y$  and

$Ma(a, b, c, \dots) =$  maximum of  $a, b, c, \dots$

63. Value of  $Ma[md(a), mn(md(b), a), mn(ab, md(ac))]$  where  $a = -2, b = -3, c = 4$  is  
 (a) 2 (b) 6 (c) 8 (d) -2
64. Given that  $a > b$  then the relation  $Ma[md(a), mn(a, b)] = mn[a, md(Ma(a, b))]$  does not hold if  
 (a)  $a < 0, b < 0$  (b)  $a > 0, b > 0$   
 (c)  $a > 0, b < 0, |a| < |b|$  (d)  $a > 0, b < 0, |a| > |b|$
65. A water tank has three taps A, B, and C. A fills four buckets in 24 minutes, B fills 8 buckets in 1 hour and C fills 2 buckets in 20 minutes. If all the taps are opened together a full tank is emptied in 2 hours. If a bucket can hold 5 litres of water, what is the capacity of the tank?  
 (a) 120 litres (b) 240 litres (c) 180 litres (d) 60 litres

66. Shyam went from Delhi to Shimla via Chandigarh by car. The distance from Delhi to Chandigarh is  $\frac{3}{4}$  times the distance from Chandigarh to Shimla. The average speed from Delhi to Chandigarh was half as much again as that from Chandigarh to Shimla. If the average speed for the entire journey was 49 kmph. What was the average speed from Chandigarh to Shimla?  
(a) 39.2 kmph                      (b) 63 kmph                      (c) 42 kmph                      (d) None of these
67. Fourth term of an arithmetic progression is 8. What is the sum of the first 7 terms of the arithmetic progression?  
(a) 7                                      (b) 64                                      (c) 56                                      (d) Cannot be determined
68. It takes the pendulum of a clock 7 seconds to strike 4 o'clock. How much time will it take to strike 11 o'clock?  
(a) 18 seconds                      (b) 20 seconds                      (c) 19.25 seconds (d) 23.33 seconds
69. Along a road lie an odd number of stones placed at intervals of 10m. These stones have to be assembled around the middle stone. A person can carry only one stone at a time. A man carried out the job starting with the stone in the middle, carrying stones in succession, thereby covering a distance of 4.8 km. Then the number of stones is  
(a) 35                                      (b) 15                                      (c) 29                                      (d) 31
70. What is the smallest number which when increased by 5 is completely divisible by 8, 11 and 24?  
(a) 264                                      (b) 259                                      (c) 269                                      (d) None of these
71. A man buys spirit at Rs. 60 per litre, adds water to it and then sells it at Rs. 75 per litre. What is the ratio of spirit to water if his profit in the deal is 37.5%?  
(a) 9 : 1                                      (b) 10 : 1                                      (c) 11 : 1                                      (d) None of these
72. Four friends start from four towns, which are at the four corners of an imaginary rectangle. They meet at a point which falls inside the rectangle, after travelling distances of 40, 50 and 60 metres. The maximum distance that the fourth could have traveled is (approximately) ....  
(a) 67 metres                      (b) 52 metres                      (c) 22.5 metres                      (d) Cannot be determined
73. A and B walk from X to Y, a distance of 27 km at 5 kmph and 7 kmph respectively. B reaches Y and immediately turns back meeting A at Z. What is the distance from X to Z?  
(a) 25 km                                      (b) 22.5 km                                      (c) 24 km                                      (d) 20 km

**Q74 – 76 : are based on the following information:**

Alphonso, on his death bed, keeps half his property for his wife and divide the rest equally among his three sons Ben, Carl and Dave. Some years later Ben dies leaving half his property to his widow and half to his brothers Carl and Dave together, shared equally. When Carl makes his will he keeps half his property for his widow and the rest he bequeaths to his younger brother Dave. When Dave dies some years later, he keeps half his property for his widow and the remaining for his mother. The mother now has Rs. 1,575,000.

74. What was the worth of the total property?  
(a) Rs. 30 lakh                      (b) Rs. 8 lakh                      (c) Rs. 18 lakh                      (d) Rs.24 lakh

75. What was Carl's original share?  
 (a) Rs. 4 lakh                      (b) Rs. 12 lakh                      (c) Rs. 6 lakh                      (d) Rs. 5 lakh
76. What was the ratio of the property owned by the widows of the three sons, in the end?  
 (a) 7 : 9 : 13                      (b) 8 : 10 : 15                      (c) 5 : 7 : 9                      (d) 9 : 12 : 13
77.  $\log_6 216\sqrt{6}$  is  
 (a) 3                      (b)  $\frac{3}{2}$                       (c)  $\frac{7}{2}$                       (d) None of these
78. There is a leak in the bottom of the tank. This leak can empty a full tank in 8 hours. When the tank is full, a tap is opened into the tank which admits 6 litres per hour and the tank is now emptied in 12 hours. What is the capacity of the tank?  
 (a) 28.8 litres                      (b) 36 litres                      (c) 144 litres                      (d) Cannot be determined
79. Which is the least number that must be subtracted from 1856, so that the remainder when divided by 7, 12, and 16 is 4.  
 (a) 137                      (b) 1361                      (c) 140                      (d) 172
80. A dealer offers a cash discount of 20% and still makes a profit of 20%, when he further allows 16 articles to a dozen to a particularly sticky bargainer. How much percent above the cost price were his wares listed?  
 (a) 100%                      (b) 80%                      (c) 75%                      (d)  $66\frac{2}{3}\%$

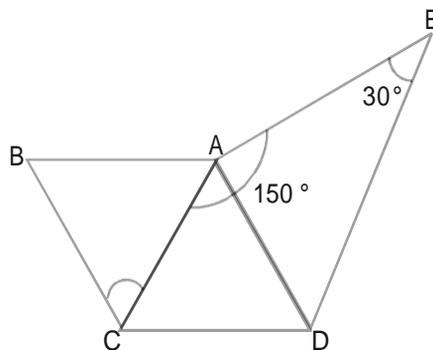
**Q81 – 85 : Data is provided followed by two statements – I and II – both resulting in a value, say I and II. As your answer,**

Mark (a) if I > II.

Mark (b) if I < II.

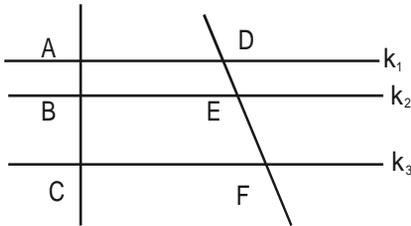
Mark (c) if I = II.

Mark (d) if nothing can be said.



81. Nineteen year from now Jackson will be 3 times as old as Joseph is now. Johnson is three years younger than Jackson.  
 I. Johnson's age now.  
 II. Joseph's age now.

82. In  $\triangle ACD$ ,  $AD = AC$  and  $\angle C = 2\angle E$ . The distance between parallel lines  $AB$  and  $CD$  is  $h$ . Then  
 I. Area of parallelogram  $ABCD$   
 II. Area of  $\triangle ADE$
83. Last week Martin received \$ 10 in commission for selling 100 copies of a magazine. Last week Miguel sold 100 copies of this magazine. He received his salary of \$ 5 per week plus a commission of 2 cents for each of the first 25 copies sold, 3 cents for each of next 25 copies sold and 4 cents for each copy thereafter. (\$1 = 100 cents).  
 I. Martin's commission in the last week.  
 II. Miguel's total income for last week.
84.  $k_1, k_2, k_3$  are parallel lines.  $AD = 2$  cm,  $BE = 8$  cm and  $CF = 32$  cm.



- I.  $(AB) \times (EF)$   
 II.  $(BC) \times (DE)$
85. I. The probability of encountering 54 Sundays in a leap year.  
 II. The probability of encountering 53 Sundays in a non-leap year.
86. The winning relay team in a high school sports competition clocked 48 minutes for a distance of 13.2 km. Its runners A, B, C and D maintained speeds of 15 kmph, 16 kmph, 17 kmph, and 18 kmph respectively. What is the ratio of the time taken by B to than taken by D?  
 (a) 5 : 16                      (b) 5 : 17                      (c) 9 : 8                      (d) 8 : 9

**Q87 – 90 : are based on the following information:**

If  $f(x) = 2x + 3$  and  $g(x) = \frac{x-3}{2}$ , then

87.  $f \circ g(x)$  is equal to  
 (a) 1                      (b)  $\text{gof}(x)$                       (c)  $\frac{15x+9}{16x-5}$                       (d)  $\frac{1}{x}$
88. For what value of  $x$ ,  $f(x) = g(x-3)$ ?  
 (a) -3                      (b)  $\frac{1}{4}$                       (c) -4                      (d) None of these.

89. What is the value of  $(\text{gofofogogof})(x)$   $(\text{fogofog})(x)$ ?

- (a)  $x$       (b)  $x^2$       (c)  $\frac{5x+3}{4x-1}$       (d)  $\frac{(x+3)(5x+3)}{(4x-5)(4x-1)}$

90. What is the value of  $\text{fo}(\text{fog})\text{o}(\text{gof})(x)$ ?

- (a)  $x$       (b)  $x^2$       (c)  $2x+3$       (d)  $\frac{x+3}{4x-5}$

**Q91 to 100 : 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 statement II are needed to answer the question, and

Mark (d), If the question cannot be answered even with the help of both the statements.

91. Is the distance from the office to home less than the distance from the cinema hall to home?

- I. The time taken to travel from home to office is as much as the time taken from home to the cinema hall, both distance being covered without stopping.
- II. The road from the cinema hall to home is bad and speed reduces, as compared to that on the road from home to the office.

92. A and B work at digging a ditch alternately for a day each. If A can dig a ditch in 'a' days and B can dig that ditch in 'b' days, will work get done faster if A begins the work?

I. n is a positive integer such that  $n\left(\frac{1}{a} + \frac{1}{b}\right) = 1$

II.  $b > a$

93. If twenty sweets are distributed among some boys and girls such that each girl gets two sweets and each boy gets three sweets, what is the number of boys and girls?

- I. The number of girls is not more than five.
- II. If each girl gets 3 sweets and each boy gets 2 sweets, the number of sweets required for the children will still be the same.

94. If the selling price were to be increased by 10%, the sales would reduce by 10%. In what ratio would profits change?

- I. The cost price remains constant.
- II. The cost price increased 10%.

95. What is the average weight of the 3 new team members who are recently included into the team?

- I. The average weight of the team increases by 20 kg.
- II. The 3 new men substitute earlier members whose weights are 64 kg, 75 kg and 66 kg.

96. Is segment PQ greater than segment RS?

- I.  $PB > RE, BQ = ES$ .
- II. B is a point on PQ, E is a point on RS.

97. Three boys had a few coffee Bite toffees with them. The number of toffees with the second were four more than those with the first and the number of toffees with the third were four more than those with the second. How many toffees were there in all?
- The number of toffees with each of them is a multiple of 2.
  - The first boy ate up four toffees from what he had and the second boy ate up six toffees from what had and the third boy gave them two toffees each from what he had and the number of toffees remaining with each of them formed a geometric progression.
98. Little Beau Peep lost her sheep. She couldn't remember how many were there. She knew she would have 400 more next year, than the number of sheep she had last year. How many sheep were there?
- The number of sheep last year was 20% more than the year before that and this simple rate of increase continues to be the same for the next 10 years.
  - The increase is compounded annually.
99. What will be the total cost of creating a 1- foot border of tiles along the inside edges of a room?
- The room is 48 feet in length and 50 fet in breadth.
  - Every tile costs Rs. 10.
100. Ten boys go to a neighbouring orchard. Each boy steals a few mangoes. What is the total number of mangoes they steal?
- The first boy steals 4 mangoes and the fourth boy steals 16 mangoes and the eight boy 32 mangoes and the tenth boy steals 40 mangoes.
  - The first boy stole the minimum number of mangoes and the tenth boy stole the maximum number of mangoes.

## Section – III

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### Passage – 1

The communities of ants are sometimes very large, numbering even up to 500, individuals: and it is a lesson to us that no one has ever yet seen quarrel between any two ants belonging to the same community. On the other hand, it must be admitted that they are in hostility not only with most other insects, including ants of different species, but even with those of the same species if belonging to different communities. I have over and over again introduced ants from one of my nests into another nest of the same species; and they were invariably attacked, seized by a leg or an antenna, and dragged out.

It is evident, therefore, that the ants of each community all recognize one another, which is very remarkable. But more than this, I several times divided a nest into two halves and found that even after separation of a year and nine months they recognize one another and were perfectly friendly, while they at once attacked ants from a different nest, although of the same species.

It has been suggested that the ant of each nest have some sign or password by which they recognize one another. To test this I made some of them insensible, first I tried chloroform; but this was fatal to them, and I did not consider the test satisfactory. I decided therefore to intoxicate them. This was less easy than I had expected. None of my ants would voluntarily degrade themselves by getting drunk. However, I got over the difficulty by putting them into whisky for a few moments. I took fifty specimens - - twenty five percent from one nest and twenty five percent from another made them dead drunk, marked each with a spot of paint, and put them on a table close to where other ants from one the nests were feeding. The table was surrounded as usual with a moat of water to prevent them from straying. The ants, which were feeding, soon noticed those, which I had made drunk. They seemed quite astonished to find their comrades in such a disgraceful condition, and as much at a loss to know what to do with their drunkards as we were. After a while, however, they carried them all away; the strangers they took to the edge of the moat and dropped into the water, while they bore their friends home into the nest, where by degrees they slept off the effects of the spirits. Thus it is evident that they know their friends even when incapable of giving any sign or password.

101. An appropriate title for this passage might be
- (a) Nature's Mysteries
  - (b) Human Qualities in the Insect world
  - (c) Drunken Ants
  - (d) Communication in Ant Communities
102. Attitudes of ants towards strangers of the same species may be categorized as
- (a) indifferent
  - (b) curious
  - (c) hostile
  - (d) passive
103. The author's anecdotes of the inebriated ants would support all the following inductions except the statement that
- (a) ants take unwillingly to intoxicants
  - (b) ants aid comrades in distress
  - (c) ants have invariable recognition of their community members
  - (d) ants recognize their comrades by a mysterious password.

104. According to the passage, chloroform was less successful than alcohol for inhibiting communication because of
- (a) its expense (b) its unpredictable side effects  
(c) its unavailability (d) its fatality
105. Although the author is a scientist, his style of writing also exhibits a quality of
- (a) sophistry (b) whimsy (c) hypocrisy (d) tragedy

### **Passage – 2**

Compared with other experimental sciences, astronomy has certain limitations. First, apart from meteorites, the Moon, and the nearer planets, the objects of study are inaccessible and cannot be manipulated, although nature sometimes provides special conditions, such as eclipses and other temporary effects. The astronomer must content himself with studying radiation emitted or reflected from celestial bodies.

Second, from the Earth's surface these are viewed through a thick atmosphere that completely absorbs most radiation except within certain "windows", wavelength regions in which the radiation can pass through the atmosphere relatively freely in the optical, near-infrared, and radio bands of the electromagnetic spectrum; and even in these windows the atmosphere has considerable effects. For light, these atmospheric effects are as follows: (1) some absorption that dims the radiation somewhat, even in a clear sky; (2) refraction, which causes slight shift in the direction so that the object appears in a slightly different place; (3) scintillation (twinkling); i.e., fluctuations in brightness of effectively point – like sources such as stars, fluctuations that are, however, averaged out for objects with larger images, such as planets (the ionosphere, an ionized layer high in the atmosphere, and interplanetary medium have similar effects on radio sources); (4) image movement because of atmospheric turbulence ("bad seeing") spreads the image of a tiny point over an angle of nearly one arc second or more on the celestial sphere (one arc second equals  $1/3,600$  degrees); and (5) background light from the night sky. The obscuring effects of the atmosphere and its clouds are reduced by placing observing stations on mountains, preferably in desert regions (e.g., southern California and Chile), and away from city lights. The effects are eliminated by observing from high-altitude aircraft, balloons, rockets, space probes, and artificial satellites. From stations all or most of the atmosphere, gamma rays and X-rays—that is, high-energy radiation at extremely short wave-lengths and far-ultraviolet rays and far-infrared radiation, all completely absorbed by the atmosphere at ground level observatories can be measured. At radio wave-lengths between about one centimeter and 20 meters, the atmosphere (even when cloudy) has little effect, and man-made radio signals are the chief interference.

Third, the Earth is a spinning, shifting, and wobbling platform. Spin on its axis causes alternation of day and night and an apparent rotation of the celestial sphere with stars moving from east to west. Ground – based telescopes use a mounting that makes it possible to neutralize the rotation of Earth relative to the stars; with an equatorial mounting driven at a proper speed, the direction of the telescope tube can be kept constant for hours while the Earth turns under the mounting. Large radio telescopes usually have vertical and horizontal axes (altazimuth mounting), with their pointing continuously controlled by a computer.

In addition to the daily spin, there are much more gradual effects, called precession and nutation. Gravitational action of the Sun and Moon on the Earth's equatorial bulge causes the Earth's axis to process like a top or gyroscope, gradually tracing out a circle on the celestial sphere in about 26,000 years, and also to nutate or wobble slightly in a period of 18.6 years. The Earth's rotation and orbital motion provide the basic standard of directions of stars, so that uncertainties in the rate of these motions can lead to quite small but important uncertainties in measurements of stellar movements.

106. One of the type of radiations that cannot pass through the atmospheric 'windows' without distortion is  
(a) near infra-red spectrum. (b) far-ultraviolet spectrum.  
(c) optical band in the spectrum. (d) radio band in the spectrum.
107. One of the atmospheric effects earth – based experiments that is not mentioned in the passage is  
(a) twinkling. (b) refraction.  
(c) image movement. (d) clouds from volcano eruptions.
108. The purpose of telescope mounting is to neutralize  
(a) atmospheric interference. (b) the effect of precession.  
(c) the effect of nutation. (d) the effect of diurnal spinning.
109. The precession period of Earth is  
(a) 24 hours (b) 365.25 days (c) 18.6 years (d) 26,000 years
110. Gravitational action of the Sun and the Moon on Earth causes  
I. diurnal spinning  
II. Precession  
III. Nutation  
(a) I only (b) I and II only (c) II and III only (d) I, II and III
111. The orbital motion of the Earth  
(a) is partly caused by the moon. (b) can have uncertain rates.  
(c) has a periodicity of 18.6 years. (d) is neutralized by telescope mounting.
112. The man-made radio signals have wave-lengths of  
(a) more than 20 meters. (b) less than one centimeter.  
(c) between one centimeter and 20 meters. (d) gamma rays.

### **Passage – 3**

If American policy towards Europe in the postwar years had been a conspicuous success, and towards Asia a disappointing balance between success and failure, it could be said that the most conspicuous thing about relations with Latin America was the absence of any policy. Franklin Roosevelt, to be sure, had launched a "Good Neighbour" policy, but being a good neighbour was, it seemed, a negative rather than a positive affair, a matter of keeping hands off, of making the Monroe Doctrine, in form at least, multilateral. All through the postwar years, the states of Latin America - - Mexico and Chile were partial exceptions - - were in the throes of major economic and social crises. Population was growing faster than in any other part of the globe, without a comparable increase in wealth or productivity; the gap between the poor and the rich was widening; and as the rich and powerful turned to the military for the preservation of order and privilege, the poor turned to revolution.

Deeply involved in other quarters of the globe, the United States paid little attention to the fortunes or misfortunes of her neighbours to the south, and when she did intervene, it appeared to be on the side of order and the status quo rather than on the side of reform. So frightened was the United States of "Communism" in Latin America that it preferred military dictatorship to reformers who might drift too far to the "left", and

sustained a Batista in Cuba, a Trujillo in the Dominican Republic, a Peron in Argentina, and a Jimenez in Venezuela.

In his last two years, President Eisenhower had tried to mend his Latin American fences. Though rejecting a Brazilian proposal of a Marshall Plan for Latin America, he did take the initiative in setting up an Inter-American development Bank with a capital of one billion dollars, almost half of it supplied by the United States. Other government investments in Latin America ran to some four million dollars, while private investments exceeded nine billion. Yet though to most Americans, all this seemed a form of economic aid, many Latin Americans regarded it as economic imperialism. In September 1960, came a co-operative plan that could not be regarded as other than enlightened: the Act of Bogota, which authorized a grant of half a billion dollars to subsidize not only economic but social and educational progress in Latin America. "We are not saints", said President Eisenhower when he visited Santiago de Chile, "We know we make mistakes, but our heart is in the right place".

But was it? President Kennedy was confronted by the same dilemma that had perplexed his predecessors. Clearly it was essential to provide a large-scale aid to the countries south of Rio Grande, but should this aid go to bolster up established regimes and thus help maintain status quo, or should it be used to speed up social reforms, even at the risk of revolt? As early as 1958, the then Senator Kennedy had asserted that "the objective of our aid program in Latin America should not be to purchase allies, but to consolidate a free and democratic Western Hemisphere, alleviating those conditions which might foster opportunities for communistic infiltration and uniting our peoples on the basis of constantly increasing living standards".

This conviction that raising the standards of living was the best method of checking Communism now inspired President Kennedy's bold proposal for the creation of the alliance for progress - - a ten year plan designed to do for Latin America what Marshall Plan had done for Western Europe. It was to be "a peaceful revolution on a hemispheric scale, a vast co-operative effort, unparalleled in magnitude and nobility of purpose, to satisfy the basic needs of the American people for homes, work, land, health and schools. "To achieve this, the United States pleaded an initial grant of one billion dollars, with the promise of additional billions for the future.

113. Following World War II, which problem was the United States most concerned with regarding Latin America?
- (a) Economic stability. (b) Political ideology.  
(c) Religious persecution. (d) Military dictatorship.
114. A key reason why Latin Americans rejected the Inter-American development Bank was that
- (a) it primarily provided money for social reform subsidies.  
(b) the moneys provided were only for specific performance projects.  
(c) it constituted an extension of the Marshall Plan into Latin America  
(d) it was being used as a means to control the economic destiny of Latin America.
115. Which of the following is most closely associated with the concept of a Marshall Plan for Latin America?
- (a) The Good Neighbour Policy.  
(b) The Alliance for Progress.  
(c) The Act of Bogota.  
(d) The Monroe Doctrine.

116. According to the passage, the fundamental change in U.S. foreign policy directed towards Latin America
- (a) resulted in a deterioration of U.S. Latin American relations.
  - (b) was responsible for Peron remaining as a dictator in Peru.
  - (c) recognized that economic aid alone would prevent social revolutions.
  - (d) provided for increased military and economic aid to prevent the spread of communism in Latin America.
117. Which of the following statements is not true?
- (a) Mexico and Chile did not experience the general social crises that are common to the majority of Latin American countries.
  - (b) President Eisenhower continued in practice the theory that economic aid was the best defense against communist incursion into Latin America
  - (c) The Good Neighbour Policy favoured a multilateral interpretation of the Monroe Doctrine.
  - (d) The traditional U.S. approach in Latin America was to protect the status quo.
118. Which of the inferences can be drawn if everything said in the passage were assumed to be true?
- (a) Rebellions are fuelled by social reforms and avoided by supporting established authorities or continuing the present state of affairs.
  - (b) The American policy towards Asia can be called an overall success, though small in magnitude.
  - (c) Kennedy, in 1958, wanted America to aid South American countries to acquire more support in their fight against communism.
  - (d) Eisenhower rejected the Marshall Plan, whereas Kennedy implemented a similar one.

#### **Passage – 4**

In order to better understand conservatism in China, it is essential that one has a grasp of what the term “Chinese conservatism” means. Chinese conservatism is markedly different from the conservatism of the modern West. The political term “conservative” came about during the French Revolution and inspired men who were determined to preserve Christian and aristocratic elements in European society. Chinese conservatism began around the time of the Taiping Rebellion and had as its primary objectives the preservation of both Confucian society and non-feudal strains of pre-Opium War Chinese society. While western conservatism believes in sacredness of private property and distrust of cosmopolitanism, the Chinese conservatism is the defense of a rational cosmopolitan order. Thus, the only common area of agreement between European and Chinese conservatism is the intent to conserve.

During the Tung-chin Restoration, the great aim was the revival of Confucian values and institutions. But these aims had to be modified so that they might endure. Restoration statesmen had no desire to create a new society – they wanted to restore a society that they believed had been based on truth. The statesmen of the Restoration stretched the traditional ideology to its limits in an effort to make the Confucian system under new conditions. They were true conservatives in a great tradition, living in an age when revolutionary change was unavoidable. The aim of the Restoration was to restore to their original vitality the best of the ancient institutions. During the Restoration, the two immediate problems were the suppression of rebellion and the stabilization of foreign relations. In addition, the people were striving for a restoration of the system of government by superior civil officials.



The men in the hierarchy of the Restoration rose to prominence through proven ability in both civil and military affairs. They emphasized human and social training – that is, indoctrination, morality, and the art of leadership through the cultivation of character. The great majority of the officials rose through the examination system.

During the chaos of this period, the examination system had lost much of its effectiveness. This is important and must be noted because the examination system was the traditional avenue for selecting officials. The senior official of Restoration realized that their policies would be ineffective unless the quality of the junior official was improved, so it was their duty to weed out the officials who had attained office in irregular ways and to promote the examination system as the only way to high position. But these men of the Restoration had enough foresight to determine that it was impossible to select officials automatically on the basis of objective tests alone. As a result, the system of recommendation was ushered in, whereby; a high official sponsored the career of a promising young man. This acted as an important supplement to the examination system.

119. The traditional method for selecting officials was
  - (a) approximately by the civil government.
  - (b) the examination system.
  - (c) through a subjective testing system.
  - (d) sponsorship by a high government official.
  
120. A primary objective in the development of Restoration thought was
  - (a) to modify traditional Chinese society to reflect new conditions.
  - (b) to create a new society based on truth.
  - (c) the knowledge that Chinese conservatism is superior to western conservatism.
  - (a) the desire to familiarized China with military technology.
  
121. The major similarity between Chinese and western conservatism is
  - (a) that Chinese conservatism attempted to preserve traditions.
  - (b) that Chinese conservatism developed during the Taiping Revolution.
  - (c) the cosmopolitan nature of western conservatism.
  - (d) that Chinese conservatism is primarily land oriented.
  
122. The most significant Chinese philosopher mentioned in the passage is
  - (a) Tung-chin.
  - (b) I. Ching.
  - (c) Buddha
  - (d) None of the above.
  
123. During the Restoration, ancient institutions
  - (a) were no longer accepted as a viable alternative to western technology.
  - (b) were studied only as classical examples of a former glorious past.
  - (c) were to be the cornerstones of a changing but traditional society.
  - (d) were considered as a primary reason for the decline of traditional China.
  
124. The western conservatives intended to preserve all the following except
  - (a) Christianity.
  - (b) private property.
  - (c) cosmopolitanism.
  - (d) aristocratic elements.

125. The most appropriate title for the passage will be
- (a) The Chinese examination system.
  - (b) Chinese Conservatism
  - (c) How the officials rose
  - (d) Impact of the Taiping Rebellion

### **Passage – 5**

Every state has a constitution, since every state functions on the basis of certain rules and principles. It has often been asserted that the United States has a written constitution, but that the constitution of Great Britain is unwritten. This is true only in the sense that, in the United States, there is a formal document called the Constitution, whereas there is no such document in Great Britain. In fact, however, many parts of the British constitution exist in written form, whereas important aspects of the American constitution are wholly unwritten. The British constitution includes the bill of Rights (1689), the Act of Settlement (1700 – 01), the Parliament Act of 1911, the successive Representation of the People Acts (which extended the suffrage), the statutes dealing with the structure of the courts, the various local government acts, and many others. These are not ordinary statutes, even though they are adopted in the ordinary legislative way, and they are not codified within the structure of single orderly document. On the other hand, such institutions in the United States as the presidential cabinet and the system of political parties, though not even mentioned in the written constitution, are most certainly of constitutional significance. The presence or absence of a formal written document makes a difference, of course, but only one of degree. A single-document constitution has such advantages as greater precision, simplicity, and consistency. In a newly developing state as Israel, on the other hand, the balance of advantage has been found to lie with an uncoded constitution evolving through the growth of custom and the medium of statutes. Experience suggests that some codified constitutions are much too detailed. An overlong constitution invites disputes and litigation is rarely read or understood by the ordinary citizen and injects too much rigidity in cases in which flexibility is often preferable. Since a very long constitution says too many things on too many subjects, it must be amended often, and this makes it still longer. The United States Constitution of 7,000 words is a model of brevity, whereas many of that country's state constitutions are much too long - the longest being that of the state of Louisiana, whose constitution now has about 255,000 words. The very new, modern constitutions of the recently admitted states of Alaska and Hawaii and the Commonwealth of Puerto Rico have, significantly, very concise constitutions ranging from 9,000 to 15,000 words. The 1949 constitution of India, with 395 articles, is the wordiest of all national constitutions. In contrast, some of the world's new constitutions, such as those of Japan and Indonesia, are very short indeed.

Some constitutions are buttressed by powerful institutions such as an independent judiciary, whereas other, though committed to lofty principles, are not supported by governmental institutions endowed with the authority to defend these principles in concrete situation. Accordingly, many juristic writers distinguish between "normative" and "normal" constitutions. A normative constitution is the one that not only has the status of supreme law but it also fully activated and effective; it is habitually obeyed in the actual life of the state. A nominal constitution may express high aspirations, but it does not, in fact, reflect the political realities of the state. Article 125 of the 1936 constitution of the Soviet Union and the article 87 of the 1954 constitution of the People's Republic of China both purport to guarantee freedom of speech, but in those countries even mild expressions of dissent are likely to be swiftly and sternly repressed. Where the written constitution is only nominal, behind the verbal façade will be found the real constitution containing the basic principles according to which power is exercised in actual fact. Thus in the Soviet Union, the rules of the Communist Party describing its organs and functioning are more truly the constitution of that country than are the grand phrases of the 1936 Stalin constitution. Every state, in short has a constitution, but in

some, real constitution operates behind the façade of a nominal constitution.

126. The lengthiest constitution in the world is that of
  - (a) Great Britain.
  - (b) India
  - (c) Puerto Rico.
  - (d) Soviet Union.
  
127. The instance of a country without a written constitution mentioned in the passage is
  - (a) People's Republic of China
  - (b) Japan.
  - (c) Israel.
  - (d) Indonesia.
  
128. The unwritten parts of the US constitution deal with
  - (a) Courts.
  - (b) presidential cabinet.
  - (c) relationship between the Centre and the States.
  - (d) fundamental rights.
  
129. In the United States
  - (a) the newly admitted states have lengthy constitutions.
  - (b) the newly admitted states have concise constitutions.
  - (c) the political parties have no constitutional significance.
  - (d) the constitution can be termed 'normal'.
  
130. In countries with 'normative' constitutions
  - (a) there will be very little freedom of speech.
  - (b) there are effective instruments to enforce their provisions.
  - (c) political realities are different from what are enshrined in them.
  - (d) there are frequent amendments to them.
  
131. By 'normal' constitution, the author means
  - (a) a written constitution.
  - (b) one that contains lofty ideals.
  - (c) a lengthy constitution.
  - (d) a constitution that is not being enforced.
  
132. One of the drawbacks of a long constitution is
  - (a) its publication is expensive.
  - (b) it is difficult to understand.
  - (c) it may require to be amended frequently.
  - (d) it is difficult to enforce.
  
133. According to the author, the difference between a written and an unwritten constitution
  - (a) has no significance.
  - (b) is just one of degree.
  - (c) has been exaggerated by politicians.
  - (d) cannot be defined.

## Passage – 6

An urgent problem is now threatening libraries throughout the world. Their collections, which are crucial for diverse purposes as economic development, educational research and recreational pursuits, are in danger of disintegrating.

The problem is mainly due to one cause – the type of paper on which books have been printed for the past one and a half centuries. Until the 1850s, paper was produced from linen or cotton rags and proved to be relatively long-lasting. In the mid-19th century, however, the popular demand for paper and the commercial need for an economic method of production led to the use of mechanically ground wood pulp. Paper manufactured from wood pulp is highly acidic and therefore inherently unstable. It contains lignin – a major factor in causing paper to discolour and disintegrate. The useful lifespan of most 20th-century book papers has been estimated to be no more than a few decades.

Libraries comprise an important part of the market for printed books and they are increasingly aware of the fragility of this material. The extent of the deterioration of library collections is alarming. Surveys conducted at various major institutions reveal that 26% to 40% of the books they hold are seriously embrittled and thus unavailable for normal use.

Programmes are now being developed with two main aims in mind – on the one hand, to improve the physical condition of library collections, especially by the process called ‘mass de-acidification’ (which is designed to eliminate acid from the paper of published books and insert a buffer compound that will provide protection against future acid attack from the environment); and on the other, to transfer the contents of existing books to another medium (such as microfilm or optical disk).

Libraries will only be able to carry out these special tasks with the assistance of other experts such as book conservators and high-technology specialists. But here is another group with whom librarians have traditionally enjoyed strong affinities and whose co-operation will be crucial if the problem of decaying collections is to be arrested – namely, the printing and publishing industries. The existing problem – that of book collections already assembled in libraries – is of vast proportions, but it is intensified by the continuing use of acid-based paper in book publishing. The key issue is how to preserve the books of the future, not simply those of the past.

If the future dimensions of the conservation problem are to be curbed, there will need to be widespread adoption of paper which is of archival quality.

This change does not relate to a narrowly perceived need because the long term preservation of library collections is important – both for the overall social benefits they bring as well as for the special advantages they bestow on the printing and publishing industries.

In the first place, libraries are of critical importance to the future well-being of citizens since they provide the knowledge base of society. They contain the record of humanity – the accumulation of ideas and insights and discoveries on which social effort and progress are possible. The destruction of libraries would represent an immense cultural loss, a form of amnesia which would affect every member of society.

In the second place, printers and publishers have an economic interest in turning to paper of archival quality. So long as the libraries are acquiring books with a short lifespan they will be forced to devote an increasing share of their budgets to conservation. These budgets are severely strained by the combined

impact of inflation and currency devaluation, and there is scarcely any prospect of enlarged government funding. As a result, libraries will be compelled to balance the preservation of their collections against the expansion of those collections. In short, the choice will be between conservation and acquisition – and the funds for conservation are likely to come from acquisition budgets. This unpalatable choice will damage both libraries and the printing and publishing industries and can only be minimized in its effects by a bold decision to convert to use of permanent paper.

134. The tone of the passage is one of  
(a) informed concern.  
(b) destructive criticism.  
(c) derisive ridicule.  
(d) helpless alarm.
135. The phrase 'archival quality' implies  
(a) a smooth paper.  
(b) thick paper.  
(c) long-lasting paper.  
(d) alkaline paper.
136. Wood-pulp as raw material for paper was developed because of  
(a) the need to produce large quantities of paper.  
(b) the shortage of linen.  
(c) the need to develop non-acidic paper.  
(d) scientific research.
137. If paper has to last long ...  
(a) it should be made of cotton rags.  
(b) it should be non-acidic.  
(c) it should be alkaline.  
(d) preservatives must be used.
138. One of the reasons not mentioned in the passage in favour of producing long-lasting paper is  
(a) it will help preserve the knowledge-base of society.  
(b) it will enable more books to be brought by libraries.  
(c) it will lead to more governmental allocation to libraries.  
(d) it will help the publishing industry.
139. Purchase of new books by libraries are bound to be curtailed because of all the following reasons except  
(a) drastic reduction in governmental funding.  
(b) the need for spending more money for conservation of old books.  
(c) the need to microfilm books.  
(d) inflationary trends.
140. Continued use of wood-pulp paper in book will affect  
I. libraries.  
II. General public.  
III. the publishing industry.  
IV. The governments.  
(a) I and III only                      (b) II and III only                      (c) I, II, III and IV                      (d) I, II, and III only

141. The substance which causes paper to discolour is  
(a) acid. (b) linen. (c) lignin. (d) preservatives.

### Passage – 7

The Japanese want their Emperor to reign for long, very long, but their Prime Ministers to have very short tenures. During the 61 years Hirohito has been on the Chrysanthemum throne, 38 Prime Ministers have come and gone (or at least 32, if returns to power are left out of account). Eisaku Sato's eight uninterrupted years as Prime Minister in the Sixties and early Seventies provoked fears about the possible ill-effects of one-man leadership on Japanese democracy, and led the dominant Liberal Democratic Party (LDP) to lay down the norm of a two-year for a party chief and head of Government. Mr. Yasuhiro Nakasone, now bowing out, has served for an unusual five years. His success as Prime Minister was evidenced by the ruling party re-electing him leader more than once. But his plan to push through the Diet a Bill to levy a 5% indirect tax as part of financial reforms failed, in spite of the LDP majority in both the chambers. It was time then for him to go.

The quick turnover of Primate Minister has contributed to the functioning of the LDP through factions. In the party that has ruled Japan for 32 years continuously, factionalism is not something unseemly. The leader is chosen by hard bargaining – some foreigners call it horse-trading – among the faction leaders, followed, if necessary, by a party election. For the decision in favour of Noboru Takeshita as the next President of the LDP and Primate Minister of Japan, voting was not necessary. His hopes were stronger than those of the other two candidates – Finance Minister Kiichi Miyazawa and former Foreign Minister, Shintaro Abe – if only because he had proved himself more skillful in the game of factional politics. A one-time protégé of Mr. Kakuei Tanaka, he thrust himself forward when the leader was disgraced on a charge of accepting bribes for sale of Lockheed aircraft to Japan and debilitated by physical ailments. Mr. Takeshita took away most of Mr. Tanaka's following and now leads the biggest faction in the LDP. Mr. Nakasone persuaded Mr. Miyazawa and Mr. Abe to accept Mr. Takeshita's leadership. An election would most probably have led to the same result. Mr. Takeshita seemed to have forged a firm alliance with at least two other factions and put in his bag the votes necessary for a win.

How Mr. Takeshita will fare after taking over the reins of Government in 1987 is not so certain. He will be Japan's first Prime Minister with a humble rural origin. A dichotomy in his nature shows through his record of teaching English in a junior high school and not trying to speak that language in public later. When he was the Minister of Finance, he gave the impression of an extremely cautious man with a reverence for consensus but challengingly titled a book on his ideas 'Going My Way'. Mr. Takeshita says that continuing Mr. Nakasone's programmes would be the basis of his policy. This is not saying enough. Japan faces two main issues, tax reforms and relations with United States. Mr. Nakasone's plan to impose an indirect tax ran into effective opposition, and the friction with the U.S. over trade continues. Mr. Takeshita cannot be facing an easy future as Japan's next leader and there is nothing to show yet that he will be drawing on secret reserves of dynamism.

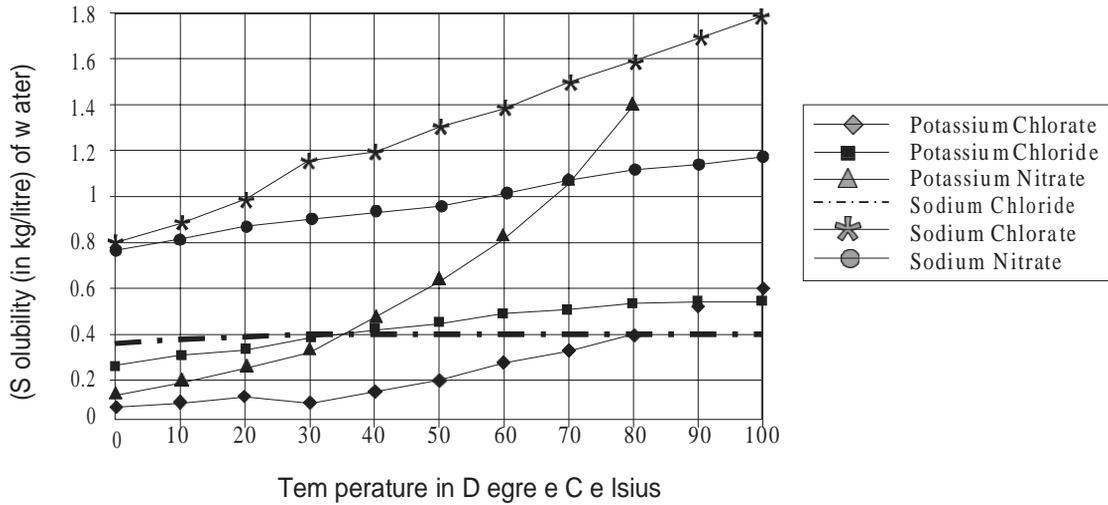
142. The politician who had been Prime Minister for the longest period since the Second World War was  
(a) Hirohito (b) Kakuei Tanaka (c) Nakasone (d) Eisaku Sato
143. When did Hirohito ascend the throne?  
(a) 1946 (b) 1926 (c) In the early fifties (d) 1936

144. Mr. Tanaka ceased to be Prime Minister because  
(a) he could not get a favourable legislative bill passed by Parliament.  
(b) he had completed the prescribed two years term.  
(c) he was involved in a bribe scandal.  
(d) of horse-trading among his party members.
145. The politician who had just recently ceased to be Prime Minister is  
(a) Eisaku Sato. (b) Yasuhiro Nakasone.  
(c) Shintaro Abe. (d) Kiichi Miyazawa.
146. Mr. Takeshita's success in the Prime Ministerial quest is due to  
(a) his financial wizardry. (b) his loyalty to his predecessor's policies.  
(c) his skill in manipulating fractional politics. (d) his good knowledge of English.
147. The author's assessment of the potential of Mr. Takeshita to be a successful Prime Minister can be summarized as one of  
(a) cautious optimism. (b) enthusiastic adulation.  
(c) objective skepticism. (d) undisguised derision.
148. Factionalism in the Liberal Democratic Party is mainly due to  
(a) the clash between urban and rural interests.  
(b) the long reign of the Emperor.  
(c) fears about one-man leadership.  
(d) frequent changes in Prime Ministers.
149. Most of the erstwhile Prime Ministers of Japan  
(a) were English educated.  
(b) were from rural areas.  
(c) had urban backgrounds.  
(d) have been former Finance Ministers.
150. The number of erstwhile Prime Ministers mentioned by name in the passage is  
(a) 2. (b) 3. (c) 4. (d) 5.

## Section – IV

**Directions for questions 151 to 155:** Answer the questions on the basis of the information given below.

Solubility-Temperature relationships for various salts.



151. Which of the following salts has greatest solubility?
  - (a) Potassium Chlorate at 80°C.
  - (b) Potassium Chloride at 35°C.
  - (c) Potassium Nitrate at 39°C.
  - (d) Sodium Chloride at 85°C.
  
152. Approximately, how many kg of Potassium Nitrate can be dissolved in 10 litres of water at 30°C?
  - (a) 0.04
  - (b) 0.4
  - (c) 4
  - (d) 0.35
  
153. By what percentage is the solubility of Potassium Chlorate in water increased as the water is heated from 30°C to 80°C?
  - (a) 100
  - (b) 200
  - (c) 250
  - (d) 300
  
154. If 1 mole of Potassium Chloride weighs 0.07456 kg, approximately. How many moles of Potassium Chloride can be dissolved in 100 litres of water at 36°C?
  - (a) 700
  - (b) 650
  - (c) 480
  - (d) 540
  
155. Which of the salts has greater change in solubility in kg / litre of water between 15°C and 25°C?
  - (a) Potassium Chlorate
  - (b) Potassium Nitrate
  - (c) Sodium Chlorate
  - (d) Sodium Nitrate



161. During 1984 – 85, how much more raw material than food was exported?  
 (a) Rs. 2580 crore      (b) Rs. 896 crore      (c) Rs. 1986 crore      (d) Rs. 1852 crore
162. Value of exports of raw materials during 1984 – 85 was how much percent less than that for 1985 – 86?  
 (a) 39      (b) 46.18      (c) 7      (d) 31.6
163. The change in value of exports of manufactured articles from 1984 – 85 to 1985 – 86 is  
 (a) 296 crore      (b) 629 crore      (c) 2064 crore      (d) 1792 crore

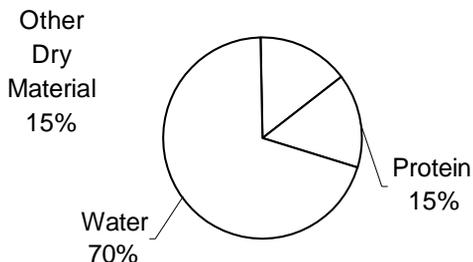
**Q164 - 166: Study the information below and answer questions based on it.**

Five of India's leading models are posing for a photograph promoting "y'know, world peace and understanding". But then, Rakesh Shreshtha the photographer is having a tough time getting them to stand in a straight line, because Aishwarya refuses to stand next to Sushmita because Sushmita had said something about her in a leading gossip magazine. Rachel and Anu want to stand together because they are "such good friends, y'know". Manpreet on the other hand cannot get along well with Rachel, because there is some talk about Rachel scheming to get a contract already awarded to Manpreet. Anu believes her friendly astrologer who has asked her to stand at the extreme right for all group photographs. Finally, Rakesh managed to pacify the girls and got a beautiful picture of five beautiful girls smiling beautifully in a beautiful straight line, promoting world peace.

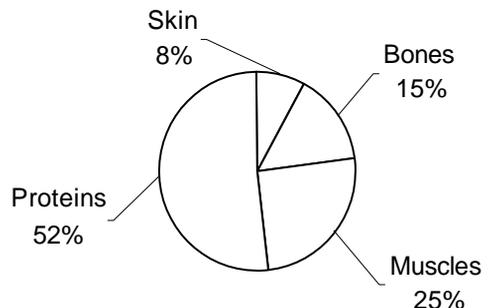
164. If Aishwarya is standing to the extreme left, which is the girl standing in the middle?  
 (a) Manpreet      (b) Sushmita      (c) Rachel      (d) Cannot say
165. If Aishwarya stands to the extreme left, which is the girl who stands second from left?  
 (a) Cannot say      (b) Sushmita      (c) Rachel      (d) Manpreet
166. If Anu's astrologer tells her to stand second from left and Aishwarya decides to stand second from right, then who is the girl standing on the extreme right?  
 (a) Rachel      (b) Sushmita      (c) Cannot say      (d) Manpreet

**Q167 – 170: refer to the pie-chart given below:**

Distribution of material in Ghosh Babu's body (as % of total body weight)



Occurance of Proteins in different organ's of Ghosh Babu's body



167. What fraction of Ghoshbabu's weight consists of muscular and skin protein?  
 (a)  $\frac{1}{13}$                       (b)  $\frac{1}{30}$                       (c)  $\frac{1}{20}$                       (d) Cannot be determined
168. Ratio of distribution of protein in muscle to the distribution of protein in skin is  
 (a) 3 : 1                      (b) 3 : 10                      (c) 1 : 3                      (d)  $3\frac{1}{2} : 1$
169. What percent of Ghosh Babu's body weight is made up of skin  
 (a) 0.15                      (b) 10                      (c) 1.2                      (d) Cannot be determined
170. In terms of total body weight, the portion of material other than water and protein is closest to  
 (a)  $\frac{3}{20}$                       (b)  $\frac{1}{15}$                       (c)  $\frac{85}{100}$                       (d)  $\frac{1}{20}$

**Q171 - 174: Study the information below and answer the questions based on it.**

A, B, C, D, E, F and G are brothers. Two brothers had an argument and A said to B "You are as old as C was when I was twice as old as D, and will be as old as E was when he was as old as C is now". B said to A " You may be older than F but G is as old as I was when you were as old as G is, and D will be as old as F was when F will be as old as G is".

171. Who is the eldest brother?  
 (a) A                      (b) E                      (c) C                      (d) Cannot be determined
172. Who is the youngest brother?  
 (a) B                      (b) D                      (c) F                      (d) Cannot be determined
173. Which two are probablytwins?  
 (a) D and G                      (b) E and C                      (c) A and B                      (d) Cannot be determined
174. Which of the following is false?  
 (a) G has 4 elder brothers.  
 (b) A is older than G but younger than E.  
 (c) B has three elder brothers.  
 (d) There is a pair of twins among the brothers.

**Q175 – 178 : are based on the following information :**

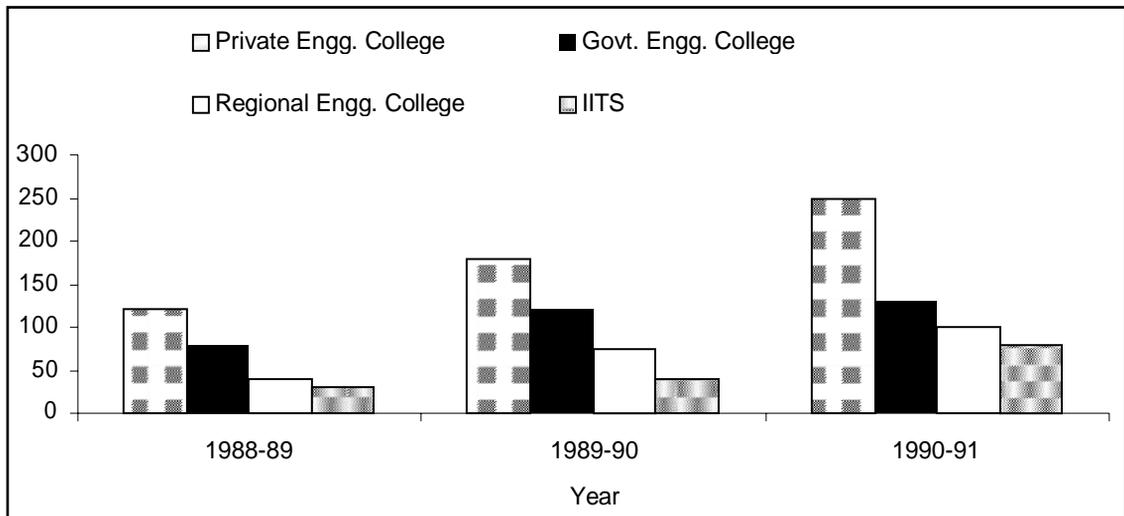
The following table gives the sales details for text books and reference books at Primary/Secondary/Higher Secondary/Graduate Levels.

Year	Primary	Secondary	Higher Secondary	Graduate Level
1975	42137	8820	65303	25343
1976	53568	10285	71602	27930
1977	58770	16437	73667	28687
1978	56872	15475	71668	30057
1979	66213	17500	78697	33682
1980	68718	20177	82175	36697

175. What is the growth rate of sales of books at primary school level from 1975 to 1980?  
 (a) 29% (b) 51% (c) 63% (d) 163%
176. Which of the categories shows the lowest growth rate from 1975 to 1980?  
 (a) Primary (b) Secondary (c) Higher secondary (d) GraduateLevel
177. Which category had the highest growth rate in the period?  
 (a) Primary (b) Secondary (c) Higher secondary (d) GraduateLevel
178. Which of the categories had either a consistent growth or a consistent decline in the period shown?  
 (a) Primary (b) Secondary (c) Higher secondary (d) GraduateLevel

**Q179 – 182 : are based on the graph given below:**

Number of Engineering Students (in hundreds) at institutions of different kinds



179. What was the total number of engineering students in 1989 – 90?  
 (a) 28500 (b) 4400 (c) 4200 (d) 42000

180. The growth rate in students of Govt. Engg. Colleges compared to that of Private Engg. Colleges between 1988 – 89 and 1989 – 90 is
- (a) more                      (b) less                      (c) equal                      (d)  $\frac{3}{2}$
181. The total number of Engg. Students in 1991 – 92, assuming a 10% reduction in the number over the previous year, is
- (a) 5700                      (b) 57000                      (c) 44800                      (d) none of these
182. In 1990 – 91, what percent of Engg. Students were studying at IIT's?
- (a) 16                      (b) 15                      (c) 14                      (d) 12

**Q183 - 186 : Study the information below and answer the questions based on it.**

The primitive tribes – folk of the island of Lexicophobos have recently developed a language for themselves. Which has a very limited vocabulary. In fact, the words can be classified into only three types : the Binges, the Cinges and the Dinges.

The Binges type of words are : Grumbs, Harrumphs, Ihavitoo

The Cinges type of words are : Ihavitoo, Jingongo, Koolodo

The Dinges type of words are : Lovitoo, Metoo, Nana

They have also devised some rules of grammar:

Every sentence must have only five words.

Every sentence must have two Binges, one Cingo and two Dinges.

If Grumbs is used in a sentence, Ihavitoo must also be used and vice versa.

Koolodo can be used in a sentence only if Lovitoo is used.

183. Which choice of words in a sentence is not possible, if no rules of grammar are to be violated?
- (a) Grumbs and Harrumphs as the Binges and Ihavitoo as the Cingo.  
 (b) Harrumphs and Ihavitoo as the Binges.  
 (c) Grumbs and Ihavitoo as the Binges and Lovitoo and Nana as the Dinges.  
 (d) Metoo and Nana as the Dinges.
184. If Grumbs and Harrumphs are the Binges in a sentence, and no rule of grammar is violated, which of the following is / are true?
- I. Ihavitoo is the Cingo.  
 II. Lovitoo is the Dingo.  
 III. Either Lovitoo or Metoo must be one of – or both – the Dinges.
- (a) I only                      (b) II only                      (c) III only                      (d) I & III only
185. Which of the following is a possible sentence if no grammar rule is violated?
- (a) Grumbs harrumphs ihavitoo lovitoo metoo.  
 (b) Grumbs harrumphs ihavitoo jingongo lovitoo.  
 (c) Harrumphs ihavitoo jingongo lovitoo metoo.  
 (d) Grumbs ihavitoo koolodo metoo nana.

186. If in a sentence Grumps is the Bingo and no rule of grammar is violated, which of the following cannot be true?
- Harrumphs must be a Bingo.
  - Ihavitoo must be a Bingo.
  - Lovitoo may be used.
  - All three Binges are used.

**Q187 – 190 : are based on the table and information given below. Answer the questions based on it.**

Bankatlal works  $x$  hours a day and rests  $y$  hours a day. This pattern continues for 1 week, with an exactly opposite pattern next week, and so on for four weeks. Every fifth week he has a different pattern. When he works longer than he rests, his wage per hour is twice what he earns per hour when he rests longer than he works.

The following are his daily working hours for the weeks numbered 1 to 13.

	1 <sup>st</sup> week	5 <sup>th</sup> week	9 <sup>th</sup> week	13 <sup>th</sup> week
<b>Rest</b>	2	3	4	-
<b>Work</b>	5	7	6	8

A week consists of six days and a month consists of 4 weeks.

187. If Bankatlal is paid Rs. 20 per working hour in the 1<sup>st</sup> week. What is his salary for the 1<sup>st</sup> month?
- Rs.1760
  - Rs.1440
  - Rs.1320
  - Rs.1680
188. Referring to the data given in Q.187, Bankatlal's average monthly salary at the end of the first four months will be
- Rs.1780
  - Rs.2040
  - Rs.1830
  - Rs.1680
189. The new manager Khushaldas stipulated that Rs.5 be deducted for every hour of rest and Rs. 25 be paid per hour starting 9<sup>th</sup> week, then what will be the change in Bankatlal's salary for the 3<sup>rd</sup> month? (Hourly deductions are constant for all weeks starting 9<sup>th</sup> week)
- Rs.540
  - Rs.480
  - Rs.240
  - Rs.120
190. Using the data in the previous questions, what will be the total earning of Bankatlal at the end of sixteen weeks.
- Rs.7320
  - Rs.7800
  - Rs.8400
  - Rs.9600

## CAT 1994 Actual Paper

# Answers and Explanations

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1	c	21	b	41	d	61	c	81	d	101	d	121	a	141	c	161	b	181	d
2	b	22	c	42	c	62	a	82	c	102	c	122	d	142	d	162	d	182	c
3	a	23	b	43	a	63	b	83	a	103	d	123	c	143	b	163	a	183	b
4	c	24	b	44	b	64	a	84	c	104	d	124	c	144	c	164	b	184	d
5	d	25	c	45	d	65	b	85	b	105	b	125	b	145	b	165	d	185	a
6	b	26	d	46	b	66	c	86	c	106	b	126	b	146	c	166	d	186	b
7	a	27	a	47	c	67	c	87	b	107	d	127	c	147	c	167	c	187	b
8	c	28	d	48	a	68	d	88	c	108	d	128	b	148	d	168	a	188	c
9	a	29	b	49	b	69	d	89	b	109	d	129	b	149	c	169	d	189	d
10	d	30	a	50	d	70	b	90	c	110	c	130	b	150	b	170	a	190	d
11	b	31	c	51	c	71	b	91	c	111	b	131	d	151	c	171	b		
12	c	32	a	52	b	72	a	92	a	112	c	132	c	152	c	172	b		
13	d	33	a	53	a	73	b	93	b	113	b	133	b	153	d	173	c		
14	b	34	b	54	c	74	d	94	b	114	d	134	a	154	d	174	c		
15	a	35	d	55	d	75	a	95	d	115	a	135	c	155	c	175	c		
16	a	36	c	56	a	76	b	96	c	116	c	136	a	156	c	176	c		
17	b	37	a	57	d	77	c	97	b	117	b	137	b	157	d	177	b		
18	d	38	b	58	d	78	c	98	c	118	a	138	c	158	a	178	d		
19	d	39	c	59	b	79	d	99	d	119	b	139	a	159	a	179	d		
20	a	40	d	60	b	80	a	100	d	120	a	140	d	160	d	180	c		

1. c C. should be the first sentence as it states that the logic presented in 1. is not true. A. and D. talk about the qualities of a good actor. B. talks about the author's own plays and 6. continues with his observation in B.
2. b C. introduces the idea that some comedies have survived over many years. B. gives a reason for it and A. continues with the reason.
3. a B. introduces 'an ally of the wind', hinted at in 1. C. states that the author did not hear it and A. gives the reason for it.
4. c D. talks about the 'power' introduced in 1. A. states that if 'it is an anchor in difficulties it should be remembered in good times too'. C. states the work done by some organizations and B. adds to it.
5. d A. suggests that seniors should help in showing the path. B. continues by referring to 'the seniors' mentioned in A. C. and D. state how one should accept the help provided by seniors.
6. b C. introduces the idea of making a will, A. gives a reason for doing so, B. and D. exemplify it through an example from author's life.
7. a C. introduces the topic of the passage, A. states how India is doing what C. has warned against. B. compares India's attitude with that of the smaller countries and D. refers to a specific case to prove the point.
8. c C. states a situation, A. contradicts by using 'but', D. states that as the trail continues one feels that one would soon see the plain, but B. shows that this hope is not fulfilled.
9. a D. introduces an idea of using something in tricks. C. gives an example of one such trick B. talks of something entertainers would do and D. tells us about something that happened during one such show.
10. d B. introduces the author, D. says that he enjoys his profession, A. and C. continue with it.
11. b Privilege can be used in A., B. and D.
12. c Disaster can fit in A., C. and D.
13. d Depression fits in A., B. and D.
14. b Imagination fits in A. and D.
15. a State fits in A., B. and D.
16. a Perjury is deliberate, willful giving of false evidence under oath i.e. lying under oath. Similarly testimony is a statement given under oath.
17. b Medieval follows prehistoric, just as future follows present.
18. d Both the pairs are pairs of synonyms.
19. d C. should precede D. as D. uses 'they' to refer to 'the evils of one's own life' mentioned in C.B. and A. logically follow.
20. a Only C. uses the noun 'the writer', which is referred to as 'he' in all other choices, hence C. should be the first one in the series. Also B should logically follow C. So this makes option (a) correct.
21. b The subject of the sentence has been introduced in A. as 'the masterpiece', so should be the first part of the sentence. A masterpiece cannot be a career, or untaught genius. Only D. can follow A.
22. c C. introduces the central point of the sentence as 'the public being easily disillusioned'. It should be the first part in the series. B., D. and then A. logically follow.
23. b D. introduces the subject as 'the roots of the riots', B. states what the roots are related to, C. gives another point of relation, which has to logically precede A.
24. b Only 'happened to be ' or 'wasn't' can grammatically fit here. 'Wasn't' does not give the sentence the appropriate meaning.
25. c One 'launches' a product.
26. d 'Unexpected success' goes best with 'fortune was made'.
27. a The correct idiomatic usage is 'smothering the flames', which means to extinguish the flames.
28. d Because there is a reference of two peoples Sam and I, there is a need to use 'Between'.
29. b 'Hinge upon' means 'depends upon'.
30. a Only 'come in' fits here, in the sense of "appear in".
31. c C. and D both present facts and no other choice gives that as an option.
32. a A. presents a judgement on part of the author, B. and C. present facts and D. presents a logical conclusion based on the facts.
33. a B. presents a fact and no other choice gives that as an option C. Presents an inference based on a logical conclusion of the fact that the revenues are already dwindling.
34. b We can see that B. presents a fact and D. presents an inference.
35. d A. and C. clearly present facts. B. is an opinion of the author based on common sense .D. presents an inference.

36. c A. is based on common sense. B. is a well known fact. C. is a logical conclusion based on B.

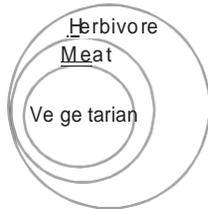
37. a B. is a well known fact which logically leads to the inference drawn in C. Other two are opinions of the author and hence judgements.

38. b B. and D. clearly present facts. C. presents an inference based on these facts.

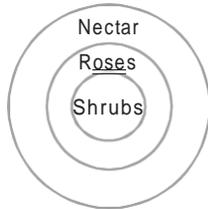
39. c A. and D. present facts, B. presents a logical conclusion based on these facts and C. presents a judgement on part of the author.

40. d A. is not a fact as it uses the phrase 'it appears'. C. and D. clearly present facts.

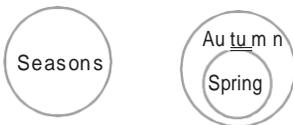
41. d



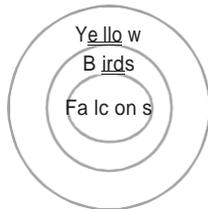
42. c



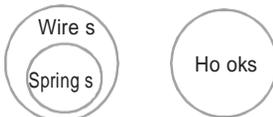
43. a



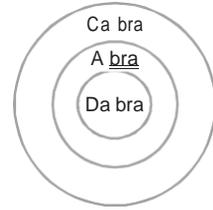
44. b



45. d



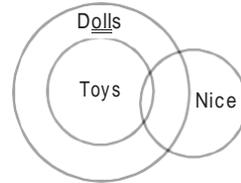
46. b



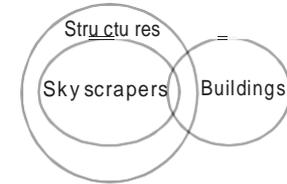
47. c



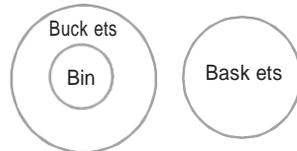
48. a



49. b



50. d



51. c Let  $x$  be the number of votes not cast for Praja Party in the previous polls.

So the number of votes not cast for the party in this assembly polls would be  $1.25x$ .

Margin of victory in the previous polls

$$= (\text{Votes cast}) - (\text{Votes not cast}) \\ = (260000 - x) - x = (260000 - 2x).$$

Margin of loss in this years polls

$$= 1.25x - (260000 - 1.25x) \\ = (2.5x - 260000).$$

As per the given information,

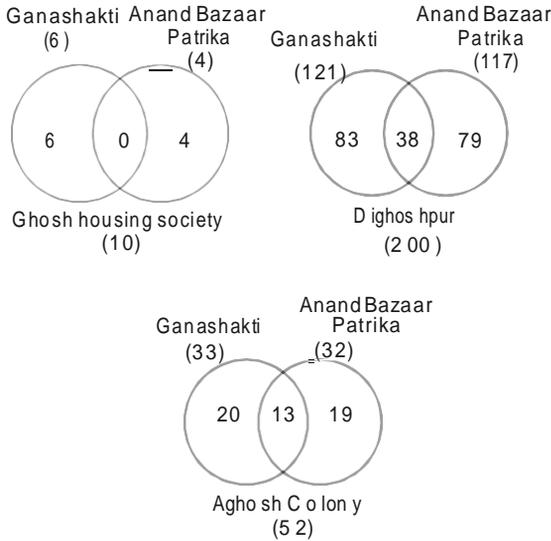
margin of loss this year =  $2 \times$  Margin of victory last year.

$$\text{Therefore, } (2.5x - 260000) = 2(260000 - 2x).$$

$$\therefore x = 120000.$$

So the number of votes cast for the party in assembly election =  $260000 - 120000$   
= 140000.

For questions 52 to 54: The data can be represented in the following Venn diagrams.



52. b Number of persons in Dighoshpur who read only Ganashakti = 83.
53. a Number of persons in Aghosh Colony who read both the newspapers = 13.
54. c Number of persons in Aghosh Colony who read only 1 newspaper = 20+19 = 39.

55. d  $\log_7 \log_5 (\sqrt{x+5} + \sqrt{x}) = 0$ ,  
We know

$$\log_a b = x \Rightarrow a^x = b$$

$$\therefore \log_5 (\sqrt{x+5} + \sqrt{x}) = 7^0$$

$$\Rightarrow \log_5 (\sqrt{x+5} + \sqrt{x}) = 1$$

$$\Rightarrow \sqrt{x+5} + \sqrt{x} = 5^1$$

$$\Rightarrow \sqrt{x+5} = 5 - \sqrt{x}$$

Squaring both sides

$$\Rightarrow x+5 = 25 + x - 2 \times 5\sqrt{x}$$

$$\Rightarrow x+5 = 25 + x + 10\sqrt{x}$$

$$\Rightarrow 10\sqrt{x} = 20$$

$$\Rightarrow \sqrt{x} = 2$$

$$\Rightarrow (\sqrt{x})^2 = (2)^2$$

$$\Rightarrow x = 4$$

56. a If the diameters and the heights of a cone and a cylinder are same, then the volume of cone is always  $\frac{1}{3}$ rd the volume of the cylinder.

So the ratio of the volume of cone to the volume of cylinder = 1 : 3.

The only answer choice that supports this is (a).

57. d

Option	Location	Expenditure of Town A students	Expenditure of Town B students	Total Expenditure
(a)	33 km from A	$33 \times 1.2 \times 30 = 1188$	$67 \times 1.2 \times 100 = 8040$	$1188 + 8040 = 9228$
(b)	33 km from B	$67 \times 1.2 \times 30 = 2412$	$33 \times 1.2 \times 100 = 3960$	$2412 + 3960 = 6372$
(c)	Town A	0	$100 \times 100 \times 1.2 = 12000$	12000
(d)	Town B	$30 \times 100 \times 1.2 = 3600$	0	3600

Hence we find that the least expenditure will be incurred if the school is located in town B.

HINT : Students please note that since there are more number of students from Town B, to minimise the total expenditure the school should be located as closer to town B as possible.

58. d There are 18 men, 15 women and 6 children.  
Working efficiency of man : woman : child = 6 : 3 : 1.  
So the ratio of the work done in a day by 18 men, 15 women and 6 children  
 $= (18 \times 6) : (15 \times 3) : (6 \times 1) = 108 : 45 : 6$ .  
Hence, the daily wage of Rs.1113 should be divided in this ratio. That makes it, Rs.756 for men, Rs.315 for women and Rs.42 for children.  
Hence, 6 children earn Rs.42 in a day.  
So the daily wage of a child should be Rs.7

59. b Let the radius and height of original cone be 'r' and 'h' respectively.

$$\therefore \text{The volume of the original cone (V)} = \frac{\pi r^2 h}{3}$$

The height and radius of the smaller cone are  $\frac{2h}{3}$  and

$$\frac{2r}{3} \text{ respectively.}$$

$$\text{So its volume} = \frac{\pi (2r)^2 \cdot 2h}{3 \times 3} = \frac{8\pi r^2 h}{9}$$

$$\text{Volume of frustum} = V - \frac{8\pi r^2 h}{9} = \frac{19V}{9}$$

$$\therefore \frac{19V}{9} : V = 19 : 9$$

$\therefore$  Ratio of the volumes = 8 : 19.

60. b Assume some values of a, b & c such that sum of a, b and c is 0 where  $a \neq b \neq c$ , and find the value of the given expression.

Let  $a = 1$ ,  $b = -1$  and  $c = 0$ .

$$\Rightarrow \frac{a^2}{2a^2 + bc} + \frac{b^2}{2b^2 + ac} + \frac{c^2}{2c^2 + ab} = \frac{1}{2} + \frac{1}{2} + 0 = 1.$$

61. c The harmonic mean of two numbers x and y is

$$\frac{2xy}{(x+y)} \text{ and the geometric mean is } \sqrt{xy}.$$

$$\therefore \frac{\frac{2xy}{(x+y)}}{\sqrt{xy}} = \frac{12}{13},$$

$$\Rightarrow \frac{4xy}{(x+y)^2} = \frac{144}{169}.$$

Although this can be simplified to get the answer, the best way to proceed from here would be to look out for the answer choices and figure out which pair of x & y satisfies the above equation. You will find the answer is (c).

**HINT :** Students please note that this sum is a classic example of how you could have gone for intelligent guess work. Since we know that the denominator of the ratio is the geometric mean, which is  $\sqrt{xy}$ , the two numbers should be in such a ratio that their product should be a perfect square. The only pair from the answer choices that supports this is 4 & 9, as  $\sqrt{4 \times 9} = \sqrt{36} = 6$ .

62. a If one root of  $x^2 + px + 12 = 0$  is 4, then  $4^2 + 4p + 12 = 0$ , i.e.  $p = -7$ .  
 $x^2 - 7x + q = 0$  has equal roots.

$$\text{If the roots are } \alpha \text{ each, } 2\alpha = -\frac{(-7)}{1} = 7, \text{ i.e. } \alpha = \frac{7}{2},$$

$$\text{and } q = \alpha^2$$

$$\Rightarrow q = \frac{49}{4}.$$

63. b  $\text{Ma}[\text{md}(-2), \text{mn}(\text{md}(-3), -2), \text{mn}(6, \text{md}(-8))]$   
 $= \text{Ma}[2, \text{mn}(3, -2), \text{mn}(6, 8)] = \text{Ma}[2, -2, 6] = 6.$

64. a For  $a > b$ , the given equation reduces to

$$\text{Ma}[|a|, |b|] = \text{mn}[a, |a|].$$

$$\text{If } b < a < 0, \text{ then } |b| > |a| > 0 > a > b.$$

$$\therefore \text{Ma}[|a|, |b|] = |a| \text{ and } \text{mn}[a, |a|] = a.$$

Hence, option (a) is correct.

65. b Since a bucket holds 5 litres of water, water discharged in one minute by tap A, B and C is  $\frac{5}{6}$  litres,

$$\frac{2}{3} \text{ litres and } \frac{1}{2} \text{ litres respectively}$$

If A, B and C are all opened simultaneously, total

$$\text{discharge in one minute} = \left( \frac{5}{6} + \frac{2}{3} + \frac{1}{2} \right) = 2 \text{ litres}$$

So in 2 hours, the discharge would be 240 litres, that is the capacity of the tank.

66. c It is clear that the ratio of the distances between (Delhi-Chandigarh) : (Chandigarh-Shimla) = 3 : 4.

The ratio of the speeds between (Delhi-Chandigarh) : (Chandigarh-Shimla) = 3 : 2.

Let the distances be 3x and 4x respectively and speeds be 3y and 2y.

$$\text{So the time taken will be } \left( \frac{x}{y} \right) \text{ and } \left( \frac{2x}{2y} \right)$$

respectively. Average speed

$$= \frac{(\text{Total Distance})}{(\text{Total Time})} = \frac{(7x)}{\left( \frac{x}{y} + \frac{2x}{2y} \right)} = \frac{7y}{3} = 49.$$

Hence,  $y = 21$ . So the average speed from Chandigarh to Shimla =  $2y = 42$  kmph.

67. c Middle term of an A.P. is average of all the terms in A.P.  
 Number of terms = 7

$$\text{Middle term} = \text{Fourth term} = 8$$

Therefore, sum of all the terms = 56.

68. d If a clock has to strike 4 or 4 times, there are 3 time intervals between the 4 strikes (Since the first strike happens at the zero<sup>th</sup> second).

So in 7 seconds the pendulum elapses 3 time intervals. To strike 11, there has to be 10 time intervals, which

$$\text{will take } \frac{10 \times 7}{3} = 23.33 \text{ seconds.}$$

69. d Let the number of stones be 'n'.

As the person covers 4.8km, he covers 2.4km on one side and 2.4km on other side.

So total distance covered by him =  $20 + 40 + 60 + \dots$

$$\therefore 2400 = \left( \frac{n}{2} \right) (2 \times 20 + (n-1)20) = 10n(n+1)$$

(Here n is the number of stones)

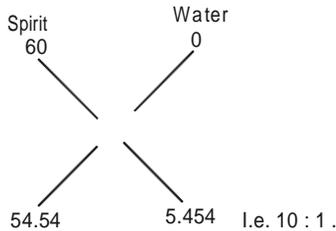
After solving, we get  $n = 15$

$$\therefore \text{Total number of stones} = 15 + 15 + 1 = 31$$

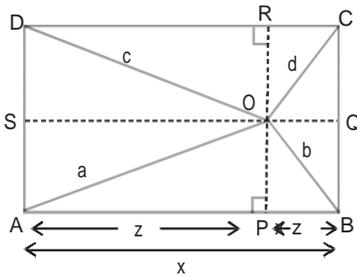
70. b Required number =  $\text{LCM}(8, 11, 24) - 5 = 259.$

71. b Since SP of spirit and solution water = Rs.75/l and there is a profit of 37.5%, CP of spirit and water solution
- $$= \frac{75}{1.375} = \text{Rs.}54.54/l$$

This should indeed be the weighted average of the costs of spirit and water. So if we alligate, we can get the ratio of spirit : water (assuming that cost of water is 0).



72. a



Let  $x$  and  $y$  be the sides of the rectangle  $ABCD$  and  $z$  be the length of  $AP$ .

Then  $CR = BP = x - z$

By applying Pythagoras Theorem, we have

$$\text{in } \triangle APO, a^2 = OP^2 + z^2 \quad \dots (i)$$

$$\text{in } \triangle BPO, b^2 = OP^2 + (x - z)^2 \quad \dots (ii)$$

$$\text{in } \triangle CRO, d^2 = OR^2 + (x - z)^2 \quad \dots (iii)$$

$$\text{in } \triangle DRO, c^2 = OR^2 + z^2 \quad \dots (iv)$$

Solving above equation, we have  $a^2 + d^2 = b^2 + c^2$

$\therefore$  For any point inside a rectangle as shown,

$$a^2 + d^2 = b^2 + c^2$$

$\therefore$  Pairing up the distance so that  $d$  is to be the maximum, we get  $40^2 + d^2 = 50^2 + 60^2$

$$\Rightarrow d = 67 \text{ m.}$$

73. b Let they meet at a distance  $x$  kms from  $X$ .  
So the total distance travelled by  $A = x$  at the speed of  $5$  kmph.  
Total distance travelled by  $B = 27 + (27 - x) = (54 - x)$  at the speed of  $7$  kmph.

$$\text{Time taken by } A = \frac{x}{5}$$

$$\text{Time taken by } B = \frac{(54 - x)}{7}$$

Since they have met at the same time, they would have travelled for the same time. Hence

$$\frac{x}{5} = \frac{(54 - x)}{7} \text{ or } x = 22.5 \text{ kms.}$$

**For question 74 to 76 :** Let us assume that Alphonso's total property was of Rs. $x$ .

Person on death bed	Pro erty given to his relatives					Total Share
	Widow	Mother	Ben	Carl	Dave	
Aplhonso	$x/2$	-	$x/6$	$x/6$	$x/6$	$x$
Ben	$x/12$	-	-	$x/24$	$x/24$	$x/6$
Carl	$5x/48$	-	-	-	$5x/48$	$5x/24$
Dave	$15x/96$	$15x/96$	-	-	-	$15x/48$

74. d Since Alphonso's wife is also the mother of Dave, the

$$\text{total share of this lady would be } \left( \frac{x}{2} + \frac{15x}{96} \right) = \frac{63x}{96}$$

$$\text{And since, } \frac{63x}{96} = 1,575,000$$

$$\Rightarrow x = \text{Rs.}24 \text{ lakhs.}$$

75. a Carl's original share was  $\frac{x}{6} = \frac{24}{6} = \text{Rs.}4$  lakhs.

76. b The ratio's of the property owned by the widows of

$$\left( \frac{1}{12} : \frac{5}{48} : \frac{15}{96} \right) = 8 : 10 : 15.$$

77. c Let  $\log_6 216\sqrt{6} = x$ .

Then by rule,  $\log_b a = x \Rightarrow b^x = a$  we have,

$$6^x = 216\sqrt{6}$$

$$6^x = 6^3 \times 6^{\frac{1}{2}}$$

$$\Rightarrow 6^x = 6^{\frac{7}{2}}$$

$$\therefore x = \frac{7}{2}$$

78. c Since the leak can empty the tank in 8 hours, the rate

$$\text{of leak} = \frac{1}{8}$$

And since the leak along with the tap can empty it in 12 hours, the equation can be rewritten as:

$$\frac{1}{x} - \frac{1}{8} = -\frac{1}{12} \quad (\text{where } x \text{ is the time taken by the tap to fill the tank}).$$

$$\text{Simplifying we get, } \frac{1}{x} = \frac{1}{24} \text{ or } x = 24.$$

This means that the tap can fill the tank in 24 hours. Since the tap admits 6 litres per hour, it will admit  $(6 \times 24) = 144$  litres in 24 hours, which should be the capacity of the tank.

79. d The LCM of 7, 12 and 16 is 336. The closest multiple of 336 to 1856 is 1680. So 1684 when divided by 7, 12 and 16 leaves a remainder of 4. This is the closest such number, less than 1856.

Hence the number to be subtracted from 1856 to get 1684, must be the least such number. So the answer is  $(1856 - 1684) = 172$ .

**Alternate method:**

Subtract options from 1856 and check.

80. a 16 articles sold at priced 12 articles, is equivalent to

$$\text{discount of } 25\% \left[ \left( \frac{16}{12} - 1 \right) \times 100 \right]$$

Hence, shop keepers offer two discounts of 20% and 25% respectively and still makes a profit of 20%

If  $c$  is the cost price of an article and  $m$  is the marked price, then  $1.2 \times c = m \times \frac{3}{4}$

$$\Rightarrow m = 2c.$$

This means that he had marked his goods 100% above his cost price.

81. d Since the ages of none of them is mentioned and we have two equations and three unknowns. Hence, we cannot say anything about the ages of any of them.

82. c Since  $\angle C = 2 \angle E$ , therefore  $\angle BCA = 60^\circ$ .

Also since ABCD is a parallelogram,  $AB = CD$  and  $AD = BC = AC$ .

Hence,  $\triangle ABC$  and  $\triangle ACD$  are equilateral triangles.

$$\text{Hence, area of this triangle} = \frac{s^2}{4} \sqrt{3},$$

where  $s$  is the side of the triangle =  $AB = AD = DC = BC$ .

$$\therefore \text{Area of the parallelogram is twice this area} = \frac{s^2}{2} \sqrt{3}.$$

Since  $\angle CAD = 60^\circ$ ,  $\angle DAE = 90^\circ$ , so  $\triangle EAD$  is a right triangle with side  $AD = s$ . Since it is a 30-60-90 triangle, hence side  $AE = s \sqrt{3}$ .

$$\therefore \text{Area of this triangle} = \frac{(s \times s \sqrt{3})}{2} = \frac{s^2}{2} \sqrt{3}$$

Hence, the required two areas are equal or  $I = II$ .

83. a Miguel's income =  $5 + (0.02 \times 25) + (0.03 \times 25) + (0.04 \times 50) = \$8.25$ .

Martin's commission = \$10.

Hence obviously  $I > II$ .

84. c Since the lines are parallel,  $\frac{AB}{BC} = \frac{DE}{EF}$ , i.e.  $AB \times EF$

$$= BC \times DE.$$

Hence  $I = II$ .

85. b 53 Sundays can occur in a non-leap year, if 1<sup>st</sup> January is either a Saturday or a Sunday. But 54 Sundays can never occur.

Hence,  $I < II$ .

86. c Since it is a relay race, all the runners ran the same distance.

Hence, for a same distance,

$$\text{ratio of times} = \frac{1}{\text{ratio of speeds}}$$

Hence, ratio of times taken by B & D =  $18 : 16 = 9 : 8$ .

87. b Let  $g(x) = \frac{x-3}{2}$  be  $y$ . So,  $\text{fog}(x) = f(y) = 2y + 3$ .

Substituting  $y = \frac{x-3}{2}$ , we get

$$\text{fog}(x) = (x-3) + 3 = x = \frac{[(2x+3)-3]}{2} = \text{gof}(x).$$

88. c If  $2x+3 = \frac{[(x-3)-3]}{2}$ , then  $x = -4$ .

89. b From Question 87,  $\text{fog}(x) = \text{gof}(x) = x$ , you will realise that if you were to form a chain of these functions for even number of times, you would still end up getting  $x$ .

For eg.  $\text{fogofog}(x) = \text{fog}(x) = x$ . Since both the brackets have the functions repeated for even number of times, each of their value will be  $x$  and their product will be  $x^2$ .

90. c From question 87,  $\text{gof}(x) = \text{fog}(x) = x$ .  
 $\text{fo(fog)o(gof)}(x) = \text{fo(fog)}(x) = f(x) = 2x + 3$ .

91. c Statement I tells us that the time taken to cover both distances is the same, but it does not tell us anything about the speeds at which these are covered. This information is given by the second statement, which says the speed from cinema hall to home is less than that between home to the office.  
Hence by using both the statements we can say that the distance between cinema hall to home is less than that between home to the office.

92. a If the total work is one unit, work done by A and B in one day will be  $\frac{1}{a}$  unit and  $\frac{1}{b}$  unit respectively.

**Using statement I:**  $\frac{n}{a} \pm \frac{n}{b} = 1$ ,

Since 'n' is an integer, if both A and B work for n days, work will be completed no matter who starts a work. Using statement II, nothing can be concluded as total amount of work is not known.

93. b  $2g + 3b = 20$ .

Since b & g should be integers the values that satisfy this equation are (g = 10 & b = 0), (g = 7 and b = 2), (g = 4 & b = 4), and (g = 1 and b = 6).

From the statement I, we can shortlist the last two possibilities i.e. g = 4 or g = 1, but cannot get a unique answer.

The statement II suggests that the number of girls and boys have to be equal. Hence we get a unique answer viz. g = 4 & b = 4. Only statement II is required to answer the question.

94. b  $P = (SP - CP) \times \text{Sales}$ . From the data given in the question we can figure out that  $P1 = (1.1SP - CP) \times$

$0.9\text{Sales}$ . Hence  $\frac{P}{P1} = \frac{1.1(SP - CP)}{(1.1SP - CP)}$ . To find this

ratio we need to eliminate the variables CP & SP. This can only be done if in the denominator, CP is replaced by 1.1CP. In other words, if the CP increases by 10%,

as in that case our ratio will be  $\frac{1.11}{1.1} = 1.01$ . Hence

only Statement II is required to answer the question.

95. d As neither average weight of the original members is not mentioned nor the number of members in original team, question cannot be answered.

96. c None of the statement alone is sufficient to answer the question.

Using both statements together:  
 $PQ = PB + BQ$  and  $RS = RE + ES$   
If  $BQ = ES$  and  $PB > RE$ ,  $PQ > PS$ .

97. b Let the number of toffees with the first, second and third boy be x, (x+4) and (x+8) respectively.  
Hence, total number of toffees =  $(3x+12)$ .

The statement I merely suggests that  $(3x+12)$  is a multiple of 2, which means that x is a multiple of 2. Nothing concrete can be concluded on the basis of this statement.

The statement II suggests that  $(x - 4 + 2)$ ,  $(x + 4 - 6 + 2)$  and  $(x + 8 - 4)$  are in GP or  $(x-2)$ , x and  $(x+4)$  is in GP.

$$\therefore x^2 = (x+4)(x-2)$$

$$\Rightarrow x = 4$$

$$\Rightarrow (3x + 12) = 24$$

Question can be answered using statement II alone.

98. c The statement I suggests that the number of sheep had increased by 20% last year over the previous year. But it does not suggest whether the rate of increase is annual or not.

For eg. 20% increase in a year can also be obtained by 9.5% increase ever 6 months. i.e.  $1.095 \times 1.095 = 1.20$ .

The statement II however suggests that the increase is compounded annually.

Hence, now we can find the answer.

If the number of sheep last year was x, then  $x + 400 = x(1.2)^2$

Hence,  $x = 909$ .

Thus we require both statements to answer the question.

99. d From the statement I, we can find out the area that needs to be bordered. And from the statement II, we can find out the cost of each tile. But to find the total cost, we require the total number of tiles and to find this we require the dimension of each tile. Since this is not known, we cannot answer the question using either statements.

100. d From the statement I, we can only find the number of mangoes stolen by 4 of the 10 boys.

The statement II suggests that the number of mangoes stolen by each of the remaining six boys is more than 4 and less than 40. Although from the two statements that are given it is tempting to assume that the number of mangoes stolen by the boys must be in AP, since it is not mentioned explicitly we cannot answer the question.

101. d The passage is basically about how ants communicate.

102. c Ants attack strangers who might belong to the same species.

103. d If they did so they would have been unable to communicate with the drunken ants.

104. d Chloroform killed the ants.

105. b The author has a playful, whimsical way of writing.

106. b All others can pass through the atmospheric windows without distortion.

107. d Clouds from volcanic eruptions do not find a mention in the passage.
108. d Telescope mounting is used to neutralize the Earth's rotation relative to the stars.
109. d The precession period of the Earth is 26,000 years.
110. c The diurnal spinning is the spinning of the Earth on its own axis, having no relation to the gravitational force of the Sun or the Moon.
111. b The last passage states that there can be uncertainty in the rate of orbital motion of the Earth.
112. c Man made signals can interfere with the radio wavelengths between 1cm. And 20m. implying that they also fall in the same range.
113. b US was more concerned with 'order' than with reforms of any kind.
114. d Latin Americans regarded it as economic imperialism.
115. a The Act of Bogota was most closely related to the Marshall Plan or Latin America.
116. c US preferred dictatorship to the spread of communism in Latin America.
117. b The President's initiative to present financial economic aid to Latin America has been presented as an example of his efforts to mend his 'Latin American fences'. Thus he was not acting to continue to keep communism from intruding the country.
118. a The passage states that speeding up social reforms implied a risk of revolt, which could be avoided by maintaining status quo.
119. b The examination system was the traditional avenue of selecting the officials.
120. a The Restoration statesmen tried to restore the society, and not create a new one. They tried to stretch the traditional ideology in order to make the Confucian system under the new conditions.
121. a The only similarity was their intent to conserve.
122. d None of these philosophers has been mentioned in the passage.
123. c The aim of the Restoration was to restore to their original vitality the best of the ancient institutes.
124. c Western conservatism distrusted cosmopolitanism.
125. b The passage is basically about Chinese Conservatism.
126. b India has the lengthiest constitution in the world.
127. c Israel does not have a written constitution.
128. b Presidential cabinet is not even mentioned in the American constitution.
129. b The constitutions of new states in the US are very concise.
130. b A normative constitution has the status of supreme law and is fully activate and effective.
131. d Where the written constitution is only nominal, behind the verbal façade will be found the real constitution containing the basic principles according to which power is exercised in actual fact.
132. c Since a long constitution says too many things, on too many subjects, it has to be amended often.
133. b The presence or absence of a written constitution makes a difference, but only of a degree.
134. a The author is concerned about the books and is also well informed about the topic.
135. c The paper of 'archival quality' refers to a long lasting paper.
136. a Wood pulp helped in producing large quantities of paper.
137. b Paper that is acidic is highly unstable.
138. c This is not a reason mentioned in the passage, for producing long lasting paper.
139. a Reduction in government funding has not been mentioned as a reason for curtailing purchase of new books.
140. d The continued use of wood pulp will not have any effect on the governments.
141. c Lignin is a major factor that causes paper to discolour.
142. d Eisaku Sato was the Prime Minister for eight years.
143. b Hirohito has been said to be on throne for 61 years at the time of writing of the passage, which was in 1987.
144. c Mr. Tanaka was involved in a bribe scandal.
145. b The passage says that Mr. Yasuhiro Nakasone is 'now bowing out'.
146. c He has proved himself more skillful in the game of factional politics and thus his hopes are stronger.

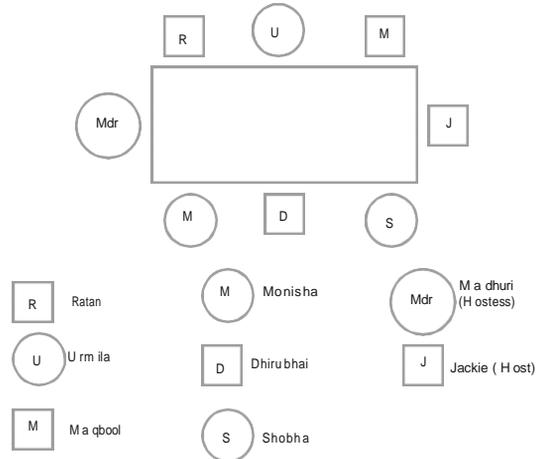
147. c The author states that how Mr. Takeshita will fare after taking over the reins of the government is not certain, and reasons about this in an objective manner.
148. d The quick turnover of Prime Ministers has led to factionalism in LDP.
149. c Mr. Takeshita will be the first Prime Minister with humble rural origins.
150. b The three Prime Ministers mentioned by name here are Mr. Nakasone, Mr. Eisaku Sato and Mr. Kakue Tanaka.
151. c

Option	Description	Solubility
(a)	Potassium Chlorate at 80°	0.4
(b)	Potassium Chloride at 35° C	0.4
(c)	Potassium Nitrate at 39° C	<b>0.48</b>
(d)	Sodium Chloride at 85° C	0.4

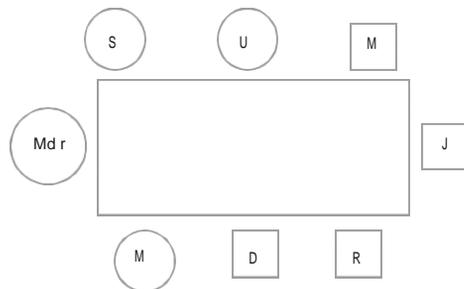
Hence (c) is the correct answer.

- 152.c At 30°C, solubility of potassium nitrate is 0.38 kg./lt. Hence in 10 litres 3.8 kg. (≈ 4 kg) of potassium nitrate can be dissolved.
153. d Percentage increase in solubility of potassium chlorate
- $$= \frac{(0.4 - 0.1) \times 100}{0.1} = 300\%$$
154. d Solubility of potassium chloride at 36°C = 0.4 kg./lt. Hence the amount of Potassium chloride that can be dissolved in 100 lt. at 36°C = 40 kg.
- $$\text{Number of moles} = \frac{40}{0.07456} \approx \frac{40}{0.075} = 533.$$
- As we have approximated 0.07456 as 0.075 and 540 is closest to 533, it should be correct answer.
155. c From the graph it can be seen that between 15°C & 25°C, solubility of sodium nitrate, potassium chloride, sodium chloride, is almost constant. It can clearly seen from graph that solubility of sodium chlorate is maximum.

**For questions 156 to 159 :** The correct seating arrangement can be depicted as shown below:



156. c Jackie is the host and also sitting on Shobha's right. Hence (c) is the correct answer.
157. d Shobha is sitting next to Jackie and Dhirubhai. So she is the only person who is not seated next to a person of the same sex.
158. a If Ratan would have exchanged seat with a person four places to his left, which is Shobha, the following arrangement would exist.



- The first statement is hence true, since no man is sitting between two woman and no woman is sitting between two man. However statements II and III are not true. Hence the answer is (a).
159. a Among the given choices, only Ratan & Monisha are sitting opposite to each other and hence they must be married.

**For questions 160 to 163:**

From the data that is given we can find the following data: (the explanation of how the following values were arrived, is given after the table).

Item	1984-85	1985-86
Food (Percentage)	22%	23%
Food (Value)	4928	5934
Manufactured Articles	11648	11352
Raw Material	5824	8514
Total Value of Exports in Crore of Rs.	22400	25800

160. d Food related exports in 1985-86 =  $0.23 \times 25800 = 5934$ .  
So food related exports in 1984-95 =  $(5934 - 1006) = 4928$ .

Hence, percentage of food related exports in 1984-85

$$= \frac{4928}{22400} \times 100 = 22\%$$

161. b In 1984-85, Value of Manufactured articles & Raw materials exports =  $(22400 - 4928) = \text{Rs.}17472$  crores. Since Export of manufactured goods is twice that of raw materials, Rs.17472 has to be divided in the ratio 2:1.

Therefore, export of manufactured goods = Rs.11648 crores and Raw materials = Rs.5824 crores.

Hence, the difference between raw material and food =  $(5824 - 4928) = \text{Rs.}896$  crores.

162. d In 1985-86, the combined percentage of Manufactured articles and Raw materials = 77% and this is in the ratio 4 : 3.

Hence, percentage of Manufactured articles export is 44% and that of Raw materials export is 33%.

Hence, value of manufactured =  $0.44 \times 25800 = \text{Rs.}11352$  crores

and the value of Raw materials = Rs.8514 crores.

Hence, percentage difference between the value of Raw materials between 1984-85 and 1985-86

$$= \left[ \frac{(8514 - 5824)}{8514} \right] \times 100 = 31.6\%$$

163. a The change in the value of exports from 1984-85 to 1985-86 =  $(11648 - 11352) = \text{Rs.}296$  crores.

**For question 164 – 166:**

From the given conditions the only arrangements that are possible is :

Left				Right	
Sushmita	Manpreet	Aishwarya	Rachel	Anu	
1	2	3	4	5	

Left				Right	
Aishwarya	Manpreet	Sushmita	Rachel	Anu	
1	2	3	4	5	

164. b If Aishwarya is standing at the extreme left, the latter arrangement holds good. Hence it is Sushmita who is standing in the middle.

165. d Again the latter arrangement holds good. So the girl who is standing second from left is Manpreet.

166. d Under the given condition, following arrangement is possible:

Left				Right	
Sushmita	Anu	Rachel	Aishwarya	Manpreet	
1	2	3	4	5	

Hence Rachel is standing on the extreme right.

167. c The skin & muscular protein totally constitutes 33% of the total proteins. The total proteins itself is 15% of the total body weight. Hence the percentage of skin & muscular protein as a fraction of the total body weight

$$= 33\% \text{ of } 15\% = 5\% = \frac{1}{20}$$

Required fraction

$$= (8 + 25)\% \text{ of } 15\% = \binom{1}{3} \times \binom{3}{20} = \frac{1}{20}$$

168. a Required Ratio =  $25 : 8 \approx 3 : 1$ .

169. d We can determine only the percentage of skin protein in Ghosh Babu's total body weight. But there is no data given about the percentage of skin in Ghosh Babu's body. Hence the answer is (d).

170. a Proportion of material other than water & protein in

$$\text{Ghosh Babu's body is } \frac{15}{100} = \frac{3}{20}$$

**For questions 171 to 174 :**

The first statement suggests : B is now as old as C was in the past. Therefore,  $B < C$ . Also sometime in the past, A was twice as old as D. So  $A > D$ . C will be as old as E in future. Hence  $C < E$ .

The second statement suggests :  $A > F$ . A was as old as G in the past. Therefore,  $A > G$ . D will be as old as F in future. So  $F > D$ . F will be as old as G now in future. This implies  $G > F$ . G was as old as B, when A was as old as G. Hence,  $A = B$ .

Combining both the results, we get :

$E > C > B = A > G > F > D$  (Note by  $A = B$ , it is meant that they are of similar age group, not necessarily the same).

171. b It could be figured out that E is the eldest brother.

172. b D is the youngest brother.

173. c Only A and B could probably be twins.

174. c It could be figured out that only statement (c) is false as B has only 2 elder brothers and not 3.

**175 – 178:**

175. c Required percentage growth

$$= \frac{(68718 - 42137) \times 100}{42137}$$

Students please note that

to calculate the exact value of this expression, we need calculator. Since, options given are not very close to each other so we can approximate values. And using approximations we get the value of required

$$\text{ratio} = \frac{(68600 - 42000) \times 100}{42000} = \frac{2650}{42} = 63\%$$

176. c

Books	1975	1980	Percentage growth
Primary	42137	68718	63%
Secondary	8820	20177	125%
Higher Secondary	65303	82175	26%
Graduate Level	25343	36697	45%

Hence, percentage growth is least for higher secondary books viz.26%.

177. b Again referring to the above table we can see that the percentage growth rate is maximum for secondary level books viz.125%.

178. d It can be seen from the given table that though primary level books have shown a consistent growth, it has declined in the year 1978. On the other hand even Secondary and Higher secondary level books have shown a consistent increase except for the year 1977 when it had declined. But the graduate level books have shown a consistent growth over the period.

**For question 179 to 182:**

The data given in the graph can be tabulated as given below :

College	1988-89	1989-90	1990-91
Private Engg. College	120	180	250
Govt. Engg. College	80	130	130
Regional Engg. College	40	70	100
IIT	30	40	80

179. d Total number of students in 1989–90 =  $(180 + 130 + 70 + 40) \times 100 = 42000$ .

180. c Growth rate in number of students in Govt. Engg.

$$\text{College} = \frac{(120 - 80)}{80} = 50\%$$

Growth rate in number of students in Private Engg.

$$\text{College} = \frac{(180 - 120)}{120} = 50\%$$

Hence the growth rate is equal.

181. d Total number of students in 1990–91 =  $(250 + 130 + 100 + 80) \times 100 = 56000$

Hence the total number of students in 1991-92 =  $0.9 \times 56000 = 50400$ . Hence (d) is the correct answer

182. c Percentage of IIT students in 1990 – 91

$$= \frac{80}{560} \times 100 = 14.28\%$$

183. b All the sentences are possible except (b) as Grumbs have to be used with Ihavitoo and Grumbs cannot be used in any other type but Binges.

184. d Since Grumbs and Harrumphs are the Binges and Grumbs has to always go with Ihavitoo, so we will have to use Ihavitoo as the Cingo. Since statement I is true, the answer can only be (a) or (d). So we will only evaluate the option (d). Since we have not used Koolodo as Cingo, we can use either Lovitoo or Metoo or both as Dingos. Hence, statement III is also true, so the answer is (d).

185. a Option (b) uses two Cingo's instead of one, hence grammatically incorrect. Option (c) violates the same rule again and in addition it uses ihavitoo without using Grumbs. Option (d) again uses two Cingo's instead of one. Hence, the only option that is grammatically correct is (a).

186. b If Grumps is the Bingo, then Ihavitoo must also be used. And since Ihavitoo is common to Bingo and Cingo, Ihavitoo must be used as a Cingo. Also no other Cingo can be used. So obviously Harrumphs must also be used as a Bingo. And since we are not using Koolodo as Cingo, we can use Lovitoo as Dingo. So (a), (c) and (d) can all be true. So (b) cannot be true.

**For questions 187 to 190:**

The data given in the question can be computed as :

187. b From the first week data we can arrive at the following work pattern of Bankatlal for the 1<sup>st</sup> month.

First Month :

	1 <sup>st</sup> w eek	2 <sup>nd</sup> w eek	3 <sup>rd</sup> w eek	4 <sup>th</sup> w eek
Hours of rest	2	5	2	7
Working hrs.	5	2	5	3
Wage per hour	Rs.20	Rs.10	Rs.20	Rs.10
Total Wage per day	Rs.100	Rs.20	Rs.100	Rs.20
Total Wage per w eek	Rs.600	Rs.120	Rs.600	Rs.120

Thus his total wage =  $(600+120+600+120) = \text{Rs.1440}$

188. c Let us compile the data for 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> month.

Second Month :

	5 <sup>th</sup> week	6 <sup>th</sup> week	7 <sup>th</sup> week	8 <sup>th</sup> week
Hours of rest	3	7	3	7
Working hrs.	7	3	7	3
Wage per hour	Rs.20	Rs.10	Rs.20	Rs.10
Total Wage per day	Rs.140	Rs.30	Rs.140	Rs.30
Total Wage per w eek	Rs.840	Rs.180	Rs.840	Rs.180

Third Month :

	9 <sup>th</sup> week	10 <sup>th</sup> week	11 <sup>th</sup> week	12 <sup>th</sup> week
Hours of rest	4	6	4	6
Working hrs.	6	4	6	4
Wage per hour	Rs.20	Rs.10	Rs.20	Rs.10
Total Wage per day	Rs.120	Rs.40	Rs.120	Rs.40
Total Wage per w eek	Rs.720	Rs.240	Rs.720	Rs.240

Fourth Month :

	13 <sup>th</sup> week	14 <sup>th</sup> week	15 <sup>th</sup> week	16 <sup>th</sup> week
Hours of rest	0	8	0	8
Working hrs.	8	0	8	0
Wage per hour	Rs.20	Rs.10	Rs.20	Rs.10
Total Wage per day	Rs.160	0	Rs.160	0
Total Wage per w eek	Rs.960	0	Rs.960	0

Total wage for 1<sup>st</sup> month = Rs.1440

Total wage for 2<sup>nd</sup> month =  $(840 + 180 + 840 + 180)$

= Rs.2040

Total wage for 3<sup>rd</sup> month =  $(720 + 240 + 720 + 240)$

= Rs.1920

Total wage for 4<sup>th</sup> month =  $(960+960) = \text{Rs.1920}$

Total wage for the 4 months =

$(1440+2040+1920+1920) = 7320$

Hence the average salary =  $\frac{7320}{4} = \text{Rs.1830}$ .

189. d Using the above data, we can revise the wage compilation for the third month as given below:

Third Month :

	9 <sup>th</sup> week	10 <sup>th</sup> week	11 <sup>th</sup> week	12 <sup>th</sup> week
Hours of rest	4	6	4	6
Working hrs.	6	4	6	4
Wage per hour or work	Rs.25	Rs.12.5	Rs.25	Rs.12.5
Fine per hour of rest	Rs.5	Rs.5	Rs.5	Rs.5
Total wage per day	Rs.150	Rs.50	Rs.150	Rs.50
Total fine per day	Rs.20	Rs.30	Rs.20	Rs.30
Effective wage per day	Rs.130	Rs.20	Rs.130	Rs.20
Total Wage per week	Rs.780	Rs.120	Rs.780	Rs.120

So now his third month wage =  $(780+120+780+120) = \text{Rs.1800}$ .

Previously he used to earn Rs.1920 in the third month. Hence change in Bankatall's salary for the 3<sup>rd</sup> month =  $(1920 - 1800) = \text{Rs.120}$ .

190. d For the fourth month, the new wage compilation will be as given below :

Fourth Month

	9 <sup>th</sup> week	10 <sup>th</sup> week	11 <sup>th</sup> week	12 <sup>th</sup> week
Hours of rest	0	8	0	8
Working hrs.	8	0	8	0
Wage per hour or work	Rs.25	Rs.12.5	Rs.25	Rs.12.5
Fine per hour of rest	Rs.5	Rs.5	Rs.5	Rs.5
Total wage per day	Rs.400	0	Rs.400	0
Total fine per day	0	Rs.40	0	Rs.40
Effective wage per day	Rs.400	-Rs.40	Rs.400	-Rs.40
Total Wage per week	Rs.2400	-Rs.240	Rs.2400	-Rs.240

So now his total wage for the 4<sup>th</sup> month =  $(2400 + 2400 - 240 - 240) = \text{Rs.4320}$ .

Since the calculations for the first two months are made as per the old scheme of things, this has already been computed.

Total wage for 1<sup>st</sup> month = Rs.1440

Total wage for 2<sup>nd</sup> month = Rs.2040

Calculation for the third and fourth month are as per new calculations and they are :

Total wage for 3<sup>rd</sup> month = Rs.1800

Total wage for 4<sup>th</sup> month = Rs.4320

Therefore, total salary for the four months =  $(1440 + 2040 + 1800 + 4320) = \text{Rs.9600}$ .

