

# CAT 1993 Actual Paper

## Answers and Explanations

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

1. d B. starts at the beginning of Indian industrialization, A. elaborates on it, C. talks about the scenario today, D. states a common element between the beginning and today. The word 'However' in D makes it the conclusive statement AC is mandatory pair. Thus option D (BACD) is the best option.
2. a BA or AB is a mandatory pair as both of them answer the question asked in the first sentence. Thus, we are left with tow options A and C. However, A is the last sentence in the group as it summarizes the efforts put by the tax authorities. Hence, A is the answer.
3. a C. makes a comparison between competition and justice. D. states what the choice is 'not between', and B. by using 'rather' shows that it should follow D. A continues with the idea and leads to 6. Also DB is a mandatory pair and hence, we are left with only one option i.e. A.
4. a A. uses 'thus' to show the effect of the disparities in Yugoslavia mentioned in B. and C. It should thus follow the two. D. uses the phrase 'will also'..., thus showing that it should follow A.
5. b The use of 'these measures' in A. refers to the measures stated in 1., so it should be the first sentence in the series. B talks about the objectives of these measures and C. and D. elaborate on the idea.

6. a D. introduces the problem related to petroleum products, A. presents statistics to support it. B. talks about electricity, an idea which is continued in 6., so B. should be the last sentence in the series.
7. b A. starts at the beginning of the last 45 years, B. states how external powers tried to control the region, D. continues with the idea. C. talks about supply of arms to Pakistan, an idea that is continued in 6.
8. c C. states a cause for the problem introduced in 1. B. starts with 'added to this', showing that it should follow C. A. introduces a way out of the situation and 6. analyses the solution. Therefore A. should precede 6.
9. c A. introduces us to Rumford's experiments, D. tells us about his observations. C. introduces the term 'caloric', B. explains the term.
10. d C. introduces a controversy regarding 'recognition', A. states an aspect of that controversy, B. talks about what happens when an object is encountered and D. talks about what happens when the same object is countered again. BD is a mandatory pair and D has to be the sentence that makes a pair with sentence 6.
11. a D. continues with the idea introduced in 1. C. states an explanation about the phenomenon, B. refers to this explanation and A. states how it was substantiated. Also A will be the last sentence as it forms a mandatory pair with sentence 6.
12. a There are two mandatory pairs in the questions. BD and A6. B. talks about the beginning of evolution changes, D. about adaptations, C. about further improvements as well as about extinctions, and A. about the approach towards modern lines.
13. c A. states that what has been predicted annually, according to 1. has not happened. B., and then D., talk about events that led to such a prediction. The use of 'then' in D. shows that it should follow B. C. makes a statement that is analysed in 6.
14. c C. introduces the topic of the passage, A. and D. explain it, B. presents the Economists' view of the whole idea.
15. a A. introduces the view of realists regarding reality, B. refers to 'this reality' and should follow A. C. refers to the realists again by using 'they' and should follow A. and B. D. presents the author's view about the given position.
16. d A. introduces 'changes in demands' as the topic sentence, D. gives some factors leading to the changes, C. elaborates on them and B. shows the effect of some more factors on the same issue.
17. c B. talks about the positive aspect of India's technological front, A. continues with the same, C. introduces the other side of the issue by using 'but' and D. contradicts C. by giving certain examples.
18. a D. introduces the topic of destruction of enemy kingdom by conquerors, C. uses the pronoun 'he' thus should follow D., B. and A. present more methods adopted by the conqueror in destroying the enemy.
19. b C. introduces the idea of various industries offering services through millions of firms, A. states that the individual firms vary in size, D. talks about other variations and B. about the variations in policies etc. within the firms.

Q20-23: If we were to number the houses 1-2-3-4 from left to right, the information given in the question can be depicted as:

Nationality	House Colour	Favourite Drink	House Number
English	Red	Milk	3
Italian	Blue	Tea	2
Norwegian	Yellow	Cocoa	1
Spaniard	White	Fruit Juice	4

Knowing this we can answer all the questions.

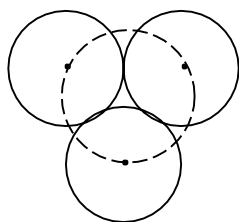
20. a The color of the Norwegian's house is yellow.
21. b Milk is drunk by the Englishman.

22. b The Norwegian drinks Cocoa
23. d The only statement that is not true is (d), as the Italian lives in house No. 2 and the Spaniard lives in house no. 4, which are not next to each other.
- Q24-27: The best way to solve these kinds of question is to assume that one of the statements is either true or false and hence figure out whether there is consistence in what everyone is saying.
24. b Let us assume that John's first statement is true. So his second statement must be false. This implies that Mathew did it. This makes Mathew's first statement false. So the second statement has to be true. This implies that Krishna didn't do it. So Krishna's first statement is true and his second statement is false. Since all the statements are consistent with each other, the assumption made by us should be the correct one. So it is Mathew who stole the boat.
25. b The key here are the statements made by Koik. Since we know that he is wearing a cap, if his first statement is false, then his second statement cannot be true. So his first statement is true and his second statement is false. This implies that Koik is the priest. This makes Lony's second statement false and so his first statement true. So Lony is Koik's son. This makes Mirna's second statement false and so his first statement true. So Lony's father is a pilot. Thus Koik is the pilot (note that he is also the priest).
26. a The first statement of Ram is obviously false, as he is saying that he never speaks to a stranger, when he actually is. So he must be new to those parts. This makes the second statement of Lila false. So he should be married to Ram. This makes the first statement of Ram false. So the left road should take you to the village.
27. b If you were observe Charle's statement carefully you will figure out that his first statement is true and second statement is false. For instance if his first statement were to be false, then his second statement cannot be true. There would be inconsistency in what he is talking. So, Charles is not the chief. This makes Bobby's second statement false and first statement true. So Bobby is Amar's father and hence Amar's first statement is false. So his second statement must be true. This implies that the chief is wearing the red shirt. So Bobby is the chief.
28. b What follows the blank shows that what has been happening till now has led to some undesirable things and hence a change is now coming in. b. is the only choice that shows what wrong has happened.
29. c c. suggests that the strategy adopted by some people is not very effective, and the idea is continued with in the passage when the author refers to it as 'this fallacy'.
30. b What follows the blank shows that the author is against the argument projected in the beginning of the passage. B. is the only choice which would support this.
31. a The passage begins with the situation of two people on two different sides of the issue. Each gets a chance to argue his or her position and after listening to each other they decide whether they wish to change their position or not. The use of 'then' after the blank shows that some action has taken place before it, and a. is the only choice showing an action.
32. d A brand is a type of product and a sports car is a type of an automobile.
33. b A gourmet is an expert on food and a connoisseur is an expert on art.
34. a North is the opposite of south and black of white.
35. d Drought and famine are synonyms as are training and skill.
36. a Nuts and bolts are used together as a phrase just as nitty-gritty are also used together.
37. b Salty is the adjective for the noun 'salt'. Bovine is the adjective for the noun 'cow'.
38. a Lack of being just is the defining characteristic of arbitrary just as lack of having order is a characteristic of chaos.

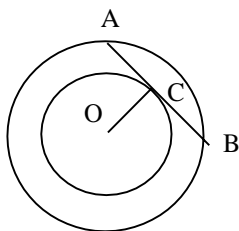
39. d A crime leads to punishment, just as a homicide leads to a penalty.
40. c Stratosphere is a layer of atmosphere, jet is a kind of an aircraft.
41. c The first word of both the pairs implies 'to cut or break up something into parts' while the second word in both means 'bringing things together'.
42. d All others relate to payments made for something.
43. d All others are related to horses.
44. d All others are synonyms.
45. d All others are nouns, while write is a verb.
46. c All others are synonyms.
47. d The correct tag question should use the same auxiliary verb as in the main clause, hence the correct tag question here would be, 'did you?'.
48. b The correct idiomatic usage is 'prevented someone from leaving'.
49. d The 'documents' are a plural noun, so should be referred to by them and not it.
50. a Here who is acting as an object for the verb invited, hence should be replaced by 'whom'.
51. d From the first statement we can say that  $X + Y \leq 20$ . This alone cannot give the value of X. Also second statement alone cannot give me the answer. But if we multiply the second statement by  $-1$ , we get  $-X + 2Y \leq -20$ . Now if we add the two statements, we get  $X \leq 20$ . But still we cannot find the value of X determinably. Hence the answer is (d).
52. c The first statement suggests a & b could be either 1, 2, 4 or 8. The second statement suggests b & c could either be 1 or 3. Since b is common to both and factor 1 is also common, we can say  $b = 1$ . So  $a = 8$  and  $c = 9$ .
53. a If the numbers are a, b, c and d such that  $a < b < c < d$ , then from the first statement we get  $(d - c) > (b - a)$ . So we can say,  $(d + a) > (b + c)$  or  $(d + a) + (d + a) > (b + c) + (d + a)$ . Dividing both sides by 4, we get  $(d + a)/2 > (a + b + c + d)/4$ . This shows that the average of the largest and smallest of four numbers is indeed greater than the average of all 4 numbers. Hence we can answer the question using first statement only.
54. d The first statement suggest that the ages could be either 1, 3 & 7 or 1, 1 & 21. The second statement doesn't reduce this further as none of the above combination when added is divisible by 3. Hence the answer is (d).
55. c From the first statement it can be said that we can manufacture 40 units of A only or 20 units of B only. However from the second statement we can find that if he wants to manufacture at least 10 units of A, he will consume 20 machine hours. In the remaining 60 hours, he can manufacture 15 units of B, which also fits in his scheme of things. Hence this is the best he can do. We require both the statements to arrive at this.
56. a From the first statement we can say that the perimeter of the hexagon is 36 cm, or the length of each side is 6 cm. From this we can find its area. So this statement alone is required to answer the question. The second statement does not supply us with any other data, but merely states the property of a regular hexagon. You should have eliminated this statement in the beginning.
57. c It is clear that both statement together is required to answer the question. As from the second statement we can find that 2 kgs. Mango is equivalent to 1 dozen oranges, and hence from the first statement we can say that 14 kgs. of mangoes cost Rs.252.

58. c The two equations are :  $2o + 3b + 4a = 15$ .  $3o + 2b + a = 10$ . Adding the two equations we get,  $5o + 5b + 5a = 25$  or  $o + b + a = 5$  i.e.  $3o + 3b + 3a = 15$ .
59. c Since the inflation rate in 1994 & 1995 is 8% each, the rate of increase in price of sugar = 10%. Hence on If price of sugar in Jan 1, 1994 is 20, I will be 22 on Jan 1, 1995 and 24.20 on Jan 1, 1996.
60. c Total number of two digit codes can be formed is  $10 \times 10 = 100$   
 Out of them 0,1,6,8,9 can create confusion.  
 Using these five digits total number of two digit numbers that can be made is  $5 \times 5 = 25$ .  
 But out of these 25 numbers 00,11,88,69 and 96 will not make any confusion.  
 Hence answer is  $100 - 25 + 5 = 80$ .
61. a It can be very easy to figure out that  $(x + y)$  will always be greater than  $xy$ , only if one of them is 1. For eg. If  $x = 1$  &  $y = 2$ , then  $(x + y) = 3$  and  $xy = 2$ . Hence  $(x + y) > xy$  Other than this for all other values of  $x$  &  $y$ ,  $(x + y)$  will always be less than  $xy$ , and hence the ratio  $(x + y)/xy < 1$ , and hence cannot be an integer. Also, even if one of the values is 1,  $(x + y)/xy$  will never be an integer. Hence the answer is (a).
62. d You can do this by the method of simulation. For eg. Let the three numbers be 1, 3 & 5. So option (a) is  $1^2 3^2 5^2 = 225$ , which is odd. (b) is  $3(1^2 + 3^3)5^2 = 2100$ , which is even.  $5 + 3 + 5^4 = 633$ , which is odd. (d) is  $5^2(1^4 + 3^4)/2 = 1025$ , which is not even and hence the answer.
63. c This can be logically done in the following manner. There are 139 players in all. We want to determine 1 champion among them. So all except 1 should lose. Since a player can lose only once and since any match produces only one loser, to produce 138 losers, there should be 138 matches that should be played.
64. a The possible cases which will give the desired result after 7 operations are:  
 (i) Number of Tails is 6 and number of Heads is 4.  
 (ii) Number of Tails is 5 and number of Heads is 5.  
 Now, when the operation is performed seven times i.e. odd number of times, the number of Tails and Heads could be (1, 9), (3, 7), (5, 5), (7, 3) and (9, 1). Thus, the only possible case is number of Tails is 5 and number of Heads is 5. Therefore the covered coin shows Head.
65. a If  $x < y$ ,  $y - x/2 = 3(x - x/2)$ .  $\therefore x/y = 2/1$ .

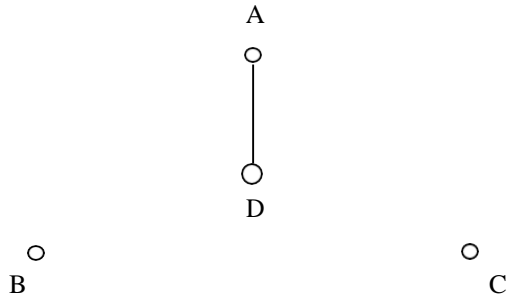
66. c It can be seen that, if we place the 3 cones touching each other, it will be similar to placing 3 circles touching, with vertices of the cone corresponding to the centers of the circles. It is hence found the centers of the circle form an equilateral triangle with each side =  $2r$ . A circle that passes through the centers will be the circumcircle to such a triangle. The radius of the circumcircle of an equilateral triangle is  $(1/\sqrt{3})$  times its side. Hence in our case it would be  $(2r/\sqrt{3})$ . Since  $\sqrt{3} = 1.73$  (approx.),  $(2r/\sqrt{3}) > r$ .



67. a If O is considered to be the centre of the circle, then since OC is perpendicular to AB (the radius of a circle is perpendicular to tangent at any point on the circumference). Hence  $AC = AB = 3$  m (Perpendicular from the centre of a circle bisects any chord of the circle). So if the radii of the inner and outer circles are  $r_1$  and  $r_2$  respectively, then since OCB is a right angled triangle,  $r_1^2 + 3^2 = r_2^2$ . Now since,  $r_1$  and  $r_2$  are integers they have to form a triplet. The only triplet with 3 in it is 3-4-5. Hence  $r_2 = 5$ .



68. b It can be seen that every city is connected to all the other cities (i.e. 3 other cities). So if we decide to start at any point, say A, there are 3 ways in which we could proceed, viz. AB, AD or AC. Once we are at any of these cities, each one of them is connected to 3 other cities. But since we cannot go back to A, there are only 2 ways in which we could proceed from here. Eg. If we are at B, we can only take BD or BC. From this point we have a choice of either directly going back to A (thus skipping 4<sup>th</sup> city or go to 4<sup>th</sup> city and come back to A. Eg. If we are at D, we can either take DA or DCA. So there are 2 more ways to go from here. So total number of ways =  $3 \times 2 \times 2 = 12$  ways.



Q69 to 70:

Since 20 of them took all three and 55 of them took at least two of the three rides, we can say that  $(55 - 20) = 35$  of them took exactly two rides. Also the number of rides taken in all = 145. Now, we know that  $x + y + z = T$  and  $x + 2y + 3z = R_T$ , where

$x$  = number of members belonging to exactly 1 set

$y$  = number of members belonging to exactly 2 sets = 35

$z$  = number of members belonging to exactly 3 sets = 20

$T$  = Total number of members who belong to at least one of the 3 sets

$R_T$  = Repeated total of all the members = 145

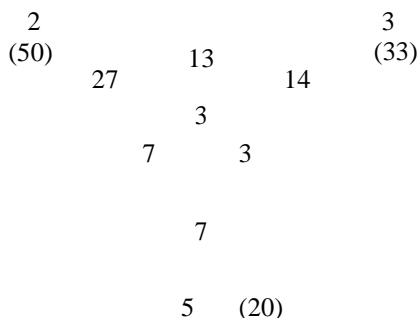
Thus we have two equations and two unknowns. Solving this we get  $x = 15$  and  $T = 70$ . Hence, 15 of them took only 1 ride and 70 of them took at least 1 of the 3 rides. This means that  $(85 - 70) = 15$  of them did not take any ride.

69. c

70. c

71. b The price on 1 mango is equal to the price of 2 oranges. Hence 5 mangoes will be equivalent to 10 oranges. So 20 oranges cost Rs.40, or one orange will cost Rs.2.

72. a The following Venn diagram shows the distribution on numbers between 1 & 100 that are divisible by 2, 3 or 5 or a combination of two or more of them. So we can see that there are 50 numbers that are divisible by 2, 33 numbers by 3 and 20 numbers by 5. There are 3 numbers are divisible by 2,3 & 5, while 7 are divisible by 2&5 (only), 13 are divisible with 2&3 (only) and 3 that are divisible by 5&3 (only). That leaves with 27 of them divisible by 2 only, 14 by 3 only and 7 by 5 only.

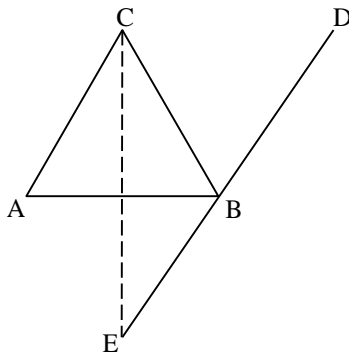


So,  $(27+13+14+7+3+3+7) = 74$  numbers are divisible by one or more among 2,3 & 5. So 26 numbers are not divisible by them.

73. a  $U_0 = 2^0 - 1 = 0$   
 $U_1 = 2^1 - 1 = 1$   
 $U_2 = 2^2 - 1 = 3$   
 $U_3 = 2^3 - 1 = 7$  and so on.  
 $\therefore U_{10} = 2^{10} - 1 = 1023.$

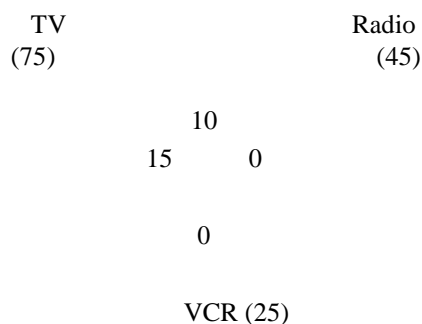
74. a  $f(x) = |x|^3 \therefore f(-x) = |-x|^3 = |x|^3 = f(x)$ . So the function is even.

75. b Let  $f(x) = g(x) + h(x)$  where  $g$  and  $h$  are odd functions.  $\therefore f(-x) = g(-x) + h(-x) = -g(x) - h(x) = -f(x)$ . So  $f(x)$  is odd.
76. a If we assume that any digit is in fixed position, then the remaining four digits can be arranged in  $4! = 24$  ways. So, each of the 5 digit will appear in each of the five places 24 times. So the sum of the digits in each position is  $24(1+3+5+7+9) = 600$  and hence the sum of all such numbers will be  $600(1 + 10 + 100 + 1000 + 10000) = 6666600$
77. c Since there are 6 red balls and all six of them are of different sizes, the probability of choosing the smallest among them is  $1/6$ .
78. b Since triangle ABC is an equilateral triangle with side 2 km, its altitude will be  $\sqrt{3}$  km. Hence D is  $\sqrt{3}$  km. to the north of A. There is only 1 answer choice that supports this, which is (b).
79. d You will realise that ABDC is a rhombus with each side 2 km. Hence  $BD = 2$  km. Since the total distance travelled =  $BD + DB + BE = 2 + 2 + BE = 4 + BE$ . So the distance travelled has to be more than 4 km. The only answer choice that supports this is (d) 6 km.



80. b Since the volume remains constant, we can say  $(8 \times 11 \times 2) = L \times \pi \times 4^2$ . i.e.  $L = 3.5$  inches.  
 Volume =  $8 \times 11 \times 2 = \pi L 8^2/4 \therefore L = 3.5$ .
81. b Since there are two numbers which are  $< 1$  (viz.  $x$  &  $y$ ), it is obvious that the median will be less than 1. Hence (c) cannot be the answer. Since  $x < 0.5$  and  $0 < y < 1$ , the median will not be  $< 0$ . Hence the answer is (b) between 0 and 1.
82. d Since,  $0 < x < 1$ , so  $0 < x^2 < 1$  or  $0 < 5x^2 < 5$ .  
 Similarly, as  $0 < x < 1$ , so  $0 < x^2 < 1$  or  $0 < 3x^2/4 < 3/4$  or  $0 > -3x^2/4 > -3/4$  or  $1/2 > (1/2 - 3x^2/4) > 1/2 - 3/4$  i.e.  $1/2 > 5x^2 > -1/4$ .  
 So, we can see that  $5x^2$  varies between 0 & 5, while  $1/2 - 3x^2/4$  varies between  $1/2$  &  $-1/4$ . Hence there is a common zone of 0 to  $1/2$  between the two. Let us check for some key values of  $x$ . If  $x = 0$ , then  $(1/2 - 3x^2/4) > 5x^2/4$ . If  $x = 1$ , then  $(1/2 - 3x^2/4) < 5x^2/4$ . Hence between  $x = 0$  &  $x = 1$ , there has to be some value of  $x$  for which  $(1/2 - 3x^2/4) = 5x^2/4$ , and this will be the maximum value of the given expression. Let us check for the same. If  $(1/2 - 3x^2/4) = 5x^2/4$ , then  $2x^2 = 1/2$ . Or  $x^2 = 1/4$ . For Or  $x^2 = 1/4$ , the value of  $5x^2/4 = 5/16 = (1/2 - 3x^2/4)$ .
83. b HINT : The first thing that you should check out for the answer choices. Since, one worker was withdrawn everyday and the last worker was withdrawn on the last last day, the number of workers should be such that it can be expressed as the sum of first  $n$  natural numbers. For eg. 3 could be the only answer that is possible as  $3 = 1+2$ . None of the other answer choices support this as  $1+2+3 = 6$  and  $1+2+3+4 = 10$ .

84. c We can form a triangle out of any 3 points which are not collinear. Hence in our case 3 points out of 5 can be chosen in  ${}^5C_3 = 10$  ways. But of these, the three points lying on the two diagonals will be collinear. So  $10 - 2 = 8$  triangles can be formed.
85. c From the data given in the question, we can make the following Venn diagram. Since no VCR owner owns only a VCR or a Radio, we can say all 100 of them own at least one among a TV or a Radio. So if we are to look at the part of the diagram for TV and Radio we can say that : Total number of people who are in these two sets = 100, of which 75 own TV and 45 own radio. So number of people who own both TV & Radio =  $(75 + 45) - 100 = 20$ . Of these 20, 10 own all three. Hence number of people having only TV & Radio = 10. Hence number of people owning only TV =  $75 - 10 - 10 - 15 = 40$ .



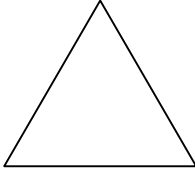
86. a  $\frac{2!}{(2-2)!2!} = \frac{2!}{(0)!2!} = \frac{2}{2} = 1$ .
87. a  $A + B = 2\left[\frac{A+B}{2}\right] = 2\left[\frac{A+B}{2}\right] = A+B$
88. a Sum of A, B, C =  $A+B+C = 3\left\{\frac{2(A+B)+C}{3}\right\} = 2(A+B) + C$ .  
HINT : Students please note that for Q71 & Q72, if it doesn't strike you to simplify in this manner, the best way is to simplify the answer choices and work backwards.
89. a The total volume of the matter =  $(20 \times 55 \times 65)$ . Let the number of pages in the new format be n. Hence the volume will be  $(65 \times 70 \times n)$ . Since the volume remains same we can equate the two and hence  $n = 15.71 = 16$  sheets. Hence percentage reduction in sheet =  $\frac{4}{20} = 20\%$ .
90. a Let us evaluate each option. (b) since  $0 < y < 1$  and  $z > 1$ ,  $yz$  will always be  $< 1$ . (c) Since both  $x$  &  $y$  are not equal to 0,  $xy$  will never be 0. (d)  $y$  is a positive number  $< 1$  and  $z$  is a positive number  $> 1$ , hence  $(y^2 - z^2)$  is always negative. Since, (b), (c) and (d) are always true, the answer has to be (a). And this can be verified. For eg. If  $x = -2$  and  $z = 3$ , then  $(x^2 - z^2) = 4 - 9 = -5$ , not a positive number.
91. b If you were to run two of three cycles of how she is counting, you will observe that the number that she counts on thumb are 1, 9, 17, 25 and so on. So it forms a pattern such that all the numbers that are 1 more than the multiples of 8 are counted on thumb. The closest multiple of 8 near 1994 is 1992. In other words she would count 1993 on thumb. So she would count 1994 on the index finger.
92. a It is clear that after a particular amount of time P & Q are equidistant from A & B respectively ( $\frac{1}{6}$ th the distance between A & B). So at this time the separation between the two is  $\frac{4}{6}$ th the distance between A & B. Since from here they are moving in opposite directions with Q moving faster than P, it is obvious that when they meet, Q would have travelled more than P. Hence they would meet closer to A.
93. d Let the speed of P be  $x$ , so the speed of Q will be  $2x$ . Hence every hour P will cover a distance of  $x$  and Q will cover a distance of  $2x$ . Since P has started an hour before Q started, he would have travelled for a distance of  $x$ . The only time when they would be equidistant from A and B respectively is after the first hour of Q starting. As in this hour Q would have moved a distance of  $2x$  and P would have moved a distance of  $x$  i.e. an overall distance of  $2x$ . And according to the data given in the question this distance ( $2x$ ) is  $\frac{1}{6}$ th the distance between A & B. So the total distance between A & B =  $12x$ . So P would take  $\frac{12x}{x} = 12$  hours to reach B.



94. c Q would cover the distance in  $12x/2x = 6$  hours. And P would cover it in  $12x/x = 12$  hours. Hence P would take 6 hours more than Q to complete the race.

95. d Required number = LCM (4, 6, 7) + 2 = 86.

96. c It can be seen that if a spherical ball is placed inside a hollow cone of same diameter, the ball won't go up to the diameter. In other words because of the slanting edges of the cone, only less than 50% of the ball would enter the cone. In other words, more than 50% of the ball would be outside the cone.



97. d The separation between the ship and the seaplane is 18 miles. And since the two are travelling in the same direction, the relative speed would be 9 times the speed of the ship (If speed of ship is  $x$  miles/hour, speed of seaplane would be  $10x$  and  $10x - x = 9x$ ). Hence to catch up with the ship the seaplane would take  $18/9x = 2/x$  hours. Now, the ship covers  $x$  miles in an hour, so in  $2/x$  hours it would cover 2 miles. So when the seaplane catches up with the ship, it would be  $18+2 = 20$  miles from the shore.

98. b From 1 to 100, you will find 50 numbers that are multiples of 2 and 20 numbers that are multiples of 5. If you multiply a number that contains one factor of 5 eg.15 with a number that contains one factor of 2 eg.6, you will get one 0 at the end of the answer i.e.90. Since the multiples of 5 are less in number than those of 2, the limiting factor in getting a 0 at the end of the answer are the multiples of 5. So ideally there should be 20 zeros at the end, if we multiply all integers from 1 to 100. But the numbers 25, 50, 75 and 100 have 2 factors of 5 each (as each of them is a multiple of 25). Since we have already accounted for 1 of them in our original count of 20, we will include 1 additional 0 of each of these 4 numbers, So the total number of zero's at the end = 24.

HINT : Students please note that the fastest way to solve such kinds of sums is :  $100/5 = 20$ ,  $100/5^2 = 4$ . Hence the answer is  $20 + 4 = 24$ .

99. d In this case since  $x$ ,  $y$  and  $z$  are distinct positive integers, our aim is figure out which of the answer choices cannot be expressed as the sum of 3 integers uniquely. For eg. 6 can only be expressed as  $(1+2+3)$ . 7 can only be expressed as  $(1+2+4)$ . But 8 can be expressed as either  $(1, 2, 5)$  or  $(1, 3, 4)$ .

100. b Since Akbar likes rain, he cannot be a frisbee player (as no frisbee player likes rain). And since every boy in the school does one of the two, Akbar has to be a fisherman.

101. b It is a manifestation of anomic suicide.

102. a Furkheim was trying to document the fact that something as individualistic as suicide can be explained without reference to individuals.

103. b It is also a manifestation of anomic suicide.

104. c This was categorised as egoistic suicide.

105. d Durkheim uses all three as explanations for suicide within a social entity.

106. a Military personnel, trained to lay their lives for the country are more likely to commit suicide.

107. b Durkheim was successful on all three indicators that he based his contentions on.

108. d He has used all the given indicators to support his contentions.

109. a This would happen due to a manifestation of strong individual ties.
110. a The passage shows that though IBM is losing ground in one market after another, Intel and Microsoft have emerged as the computer industry's most fearsome pair of competitors.
111. c IBM's 'loss' and not the 'lay off' was the biggest in the corporate history.
112. b IBM marketed Ambra.
113. b General Motors, a relatively new company, had surpassed Ford as America's No. 1 car maker.
114. d Intel was the major supplier of silicon chips to IBM.
115. c The passage states that each company feels threatened by its own creations.
116. a The passage states that IBM plans to introduce a new system that would run on a variety of machines.
117. c Windows NT, developed by Microsoft will link together many computers through a network.
118. a Both marketed their own versions of Os2.
119. b NEERI has reported that 70% of the total water available in the country is polluted.
120. a The degradation of natural resources will lead to poor economic utilization of resources.
121. c W.H.O. has made both the observations.
122. d All the given statements are supported by the passage.
123. b 75% of Ganga's pollution comes from municipal sewage.
124. c Drying up of water resources and over pumping causes drinking water crisis.
125. d US, UK, Netherlands, Poland, France, World Bank and India are together going to fund the project.
126. d Ganga, Yamuna, kali, Hindon, cauvery and Kapila, have all shown great amounts of metal pollutants in their waters.
127. a Out of a total outlay of 6,522.47 crores, rural water supply would receive 3,454.47 crores.
128. b The shortage can be best tackled by cleaning up polluted water.
129. c This task should operate at the physical, conceptual as well as at the emotional levels.
130. c Violation of space boundaries makes the quality of space suffer, hence openness of space can be created only by the firmness of its boundaries.
131. d The author has given all three as reasons that make learning a painful process.
132. d Our experiences in the physical world have parallels in our relationships with others, where the concept of space also works.
133. d The author feels that a learning space would be one where the teacher provides information and theories which encourage the process of learning.
134. a Silence unites us and we also become more open to truth.

135. c An effective teacher would be one who is not afraid of dealing with feelings.
136. c An effective teacher would never allow the learning space to be filled by reading of a big number of pages of assigned reading.
137. b An emotionally honest learning space is created by a teacher who is not afraid of dealing with feelings.
138. a Assigned reading and lecturing can create a conceptual space.
139. b The author states that the harmony among these traditional elements has made Japanese industry highly productive and given corporate leadership a long term view.
140. d It was widely perceived that management education was a passport to good life.
141. b In 1980's management education had started getting criticism from various quarters.
142. c Management education faced all other criticisms in the 1980's
143. a Japan has traditionally believed that management ability can only be acquired through years of practical experience.
144. c In 1960's and 1970's management education gained academic stature. A management professor was even awarded the Nobel prize. It also gained more respect.
145. b In 1980's critics charged that learning had little relevance to real business problems.
146. b Training programmes in Japanese corporations have sought the socialization of new comers.
147. d Increased competitive pressures and greater multi nationalism of Japanese business made Japan change its attitude towards management education.
148. a The author states that the Japanese educational system is highly developed and intensely competitive, raising the mathematical and literary capabilities of the Japanese to the highest in the world.
149. d The two differ in their process of selecting and orienting new recruits.
150. a The author has given the example of Wharton to argue that Japanese do not 'do without' business schools.

Q151- 154: The graph can be represented in the following table:

Company	Sales (1)	Expend. (2)	Profit (3)=(1)-(2)	Equity (4)	Pro/Equ (3)/(4)	Sal/Equ (1)/(4)	Sal/Exp (1)/(2)	Growth Rate Sales
1990	80	76	4	8	0.5	10	1.05	-
1991	92	88	4	8	0.5	11.5	1.04	5%
1992	106	100	6	22	0.27	4.81	1.06	15.21%
1993	128	114	14	22	0.51	5.81	1.12	20.75%

151. c It is clear that the profit per rupee of equity is highest for 1993 viz.0.51
152. c The simple annual growth rate in sales is maximum for the year 1992-93 viz.20.75%
153. b Sales per rupee of the expenditure is lowest for the year 1991 viz.1.04.
154. b Sales per rupee of equity is highest for 1991 viz.11.5

155 – 158: Let the profits of CAT & DAT be x, Sales of CAT & BAT = y and sales of ANT = z. So we have

COMPANY	SALES	EXPENDITURE	PROFIT
ANT	z	0.9z	0.1z
BAT	y	0.8y	0.2y
CAT	y	5x	x
DAT	3x		x

No, it is said that the total expenses of CAT were Rs.10 lakhs. Hence  $5x = \text{Rs.}10 \text{ lakhs}$  or  $x = \text{Rs.}2 \text{ lakhs}$ . Also Total expenses of ANT were 10% less than those of CAT = Rs.9 lakhs. Hence  $0.9z = 9 \text{ lakhs}$  or  $z = 10 \text{ lakhs}$ . Finally, In case of CAT, since Sales – Expenditure = Profit, Sales = Expenditure + Profit =  $6x = 12 \text{ lakhs}$ . Hence  $y = 12 \text{ lakhs}$ . So our table is modified to :

COMPANY	SALES	EXPENDITURE	PROFIT
ANT	10	9	1
BAT	12	9.6	2.4
CAT	12	10	2
DAT	6	4	2

(All values in lakh Rupees)

155. d From the above table it can be seen that the company that had the lowest sales is DAT viz. Rs.6 lakhs.

156. c CAT had highest total expenses i.e. Rs. 10 lakhs.

157. a ANT had lowest profits i.e. Rs. 1 lakh.

158. b BAT had the highest profits i.e. Rs. 2.4 lakhs.

Q 159-162 :

The above graph can be represented in the following manner :

	Net Fixed Assets (NFA)	Growth Rate of NFA	Net Current Assets (NCA)	Growth Rate of (NCA)	Investments	Growth Rate of investments	Total Assets (TA)	Growth Rate of Total Assets
19	7	-	13	-	2	-	22	-
19	8	14.28%	16	23%	1	-50%	25	13.63%
19	7.5	-6.25%	15	-6.25%	2	100%	25	-
19	9	20%	17	13.33%	4	100%	30	20%

159. b The growth rate of total assets between 1990-93 =  $(30-22)/22 = 36\%$ . But this is over a 3 year period. Hence simple average annual growth rate =  $36/3 = 12\%$ .

160. c It can be seen that the growth rate is lowest for investments in 1990-91 viz. 50% decrease.

161. c Between 1991 & 1992, the highest growth rate was seen for investments viz.100% increase.

162. d It can be seen that very individual item has shown a decrease in some year or the other. Only Total Assets has not shown this trend.

Q163 - 166: Students please note that the best way to solve this question is to work backwards. Since Soumya was last to eat the cookies and she ate 3 cookies, the total number of cookies left when she entered the room =  $(3 \times 4) = 12$ . This should be Soumya's share that was left in the box uneaten. Hence just before Soumya entered, Swetha, Sneha and Swarna would have eaten their share of 12 cookies each. Total number of cookies left when Sneha entered =  $(12 \times 4) = 48$ . This in turn should have been the combined shares of Sneha & Soumya  $(24 \times 2)$  that was left in the box uneaten. So Just before Sneha entered, Swetha & Swarna should have eaten 24 cookies each. In other words number of cookies left, just before Swarna entered =  $(24 \times 4) = 96$ . Now this should have been the combined shares of Swarna, Sneha and Soumya  $(3 \times 32)$  that was kept in the box by Swetha . So just before Swarna entered, Swetha must have eaten her share of 32 cookies. Hence total number of cookies given by Prem uncle =  $(32 \times 4) =$

The situation is also shown in the following table:

		Who ate How many cookies?					
		Swetha	Swarna	Sneha	Soumya	Not Eaten	Total
Who entered?	Soumya	3	3	3	3	-	12
	Sneha	12	12	12	-	12	48
	Swarna	24	24	-	-	$(24 \times 2) = 48$	96
	Swetha	32	-	-	-	$(32 \times 3) = 96$	128
Total		71	39	15	3	-	-

163. c We can see that Sneha ate 15 cookies in all.

164. a Prem uncle gave 128 cookies to Swetha.

165. d Swetha ate 71 cookies.

166. c Swarna ate 39 cookies.

Q167-171: Since 40% of the students were females, these constituted 32 students. So total number of students = 80 & total number of male students = 48. Now since half the students were either excellent or good, (number of average students) = (number of good students + number of excellent students) = 40. Hence number of excellent students =  $40 - 30 = 10$ . Finally since  $1/3^{\text{rd}}$  of male students were average, total number of male students that were average =  $(1/3 \times 48) = 16$  and hence total number of male students that were good =  $(48 - 16 - 10) = 22$ . Based on the above revelations the following table can be drawn:

	Performance			Total
	Average	Good	Excellent	
Male	16	22	10	48
Female	24	8	0	32
Total	40	30	10	80

167. a Number of students who are both female & excellent = 0.

168. c Number of students who are both male and good = 22.

169. d Ratio of male to female among average students =  $16:24 = 2:3$ .

170. b Proportion of female students who are good =  $(8/32) = 0.25$ .

171. b Proportion of good students who are male =  $(22/30) = 0.73$ .

Q172-175:

172. b

		1990		2000		2010	
		World	Asia	World	Asia	World	Asia
Total Energy		150	10	200	20	250	33
Natural Gas	Value	30	1	40	1.5	50	2
	Proportion	20%	10%	20%	7.5%	20%	6.06%
Solid Fuels	Value	50	4	60	2.5	75	5
	Proportion	33.3%	40%	30%	12.5%	30%	15.1%
Petroleum	Value	50	4	70	10	80	15
	Proportion	33.3%	40%	35%	50%	32%	45.4%

Thus we can see that Solid Fuels and Petroleum combined constitute more than 60% of total energy in both World & Asia for the given period.

173. a As seen from the above table, Petroleum is the fuel whose proportion in the total energy demand increases during 1990-2000 and decreases during 2000-2010 for both world & Asia.

174. d For the answer choices given and for Asia we can make the following table.

		1990	2000	2010
Total Energy		10	20	33
Natural Gas	Value	0.5	2.5	5
	Proportion	5%	12.5%	15.15%
Solid Fuels	Value	4	5	10
	Proportion	40%	25%	30.3%
Nuclear	Value	0.5	1	1.3
	Proportion	5%	5%	3.9%
Hydropower	Value	1	1.5	2
	Proportion	10%	7.5%	6.06%

Hence we can see that the proportion of Hydropower goes on decreasing over the period.

175. b For the answer choices given and for world we can make the following table.

		1990	2000	2010
Total Energy		150	200	250
Natural Gas	Value	30	40	50
	Proportion	20%	20%	20%
Solid Fuels	Value	50	60	75
	Proportion	33.3%	30%	30%
Nuclear	Value	10	20	25
	Proportion	6.66%	10%	10%
Hydropower	Value	10	10	20
	Proportion	6.66%	5%	8%

Hence we can see that the proportion of Nuclear gas remains constant over the given period.