Answer Key

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

Solutions for questions 1 to 11:

1. We can have squares of all sizes from side of 1 unit to side of 16 units.

   Number of squares of size $1 \times 1 = 16^2 = 256$ because on one side of the chessboard there are 16 squares of size 1×1.

   Similarly there are 15 squares of 2×2 size on one side and hence number of 2×2 squares $= 15^2 = 225$.

   Continuing on these lines, we have the answer, as

   $16^2 \, 15^2 + \dots + 1^2 = \dfrac{(n)(n+1)(2n+1)}{6}$

   where n = 16

   $= \dfrac{16 \times 17 \times 33}{6} = 8 \times 17 \times 11 = 1496$.

2. Ajit can finish the work in 10 days.

   Rakesh can do same in 15 days.

   Therefore, they together will finish the work in 6 days.

   Therefore, they together will finish the work in 6 days.

   $\therefore$ Ajit and Rakesh can finish a work twice the original one in 12 days.   **Hence(2)**

3. $\dfrac{4}{3}\pi(28^3 - 7^3)$ is volume increase required.

   $T = \dfrac{\dfrac{4}{3} \times \dfrac{22}{7} (7^3 (4^3 - 1))}{49 \times 60} = 30.8$ minutes.

4. $f = a + bx + c\sqrt{x}$

   where x is distance traveled we have,

   $400 = a + 25b + 5c$ -   (1)
   $680 = a + 49b + 7c$ -   (2)
   $1480 = a + 121b + 11c$ -   (3)
   $280 = 24b + 2c$
   $800 = 72b + 4c$
   $b = 10, c = 20$

   Substituting in (1) a = 50

   $50 + 10x + 20\sqrt{x} = 6800$

   From here you can see that x has to be a perfect square and a multiple of 25. Only 625 satisfies both these conditions.

5. Let them meet at x m from the beginning after say time t.

   Let their speed be r and s.

   For the first 500m, r = 3s

   Later r = s/2

   $\therefore \dfrac{600}{3s} + \dfrac{x - 600}{s/2} = \dfrac{x - 100}{s}$

   $\Rightarrow 200 + 2x - 1200 = x - 100$

   x = 900

   $\therefore$ They will meet 100m from the end.

   <u>Alternately :</u>

   Since Ram is thrice as fast as Shyam, when Ram covers 600 m, Shyam ran only 200 m, i.e. Shyam is at 200 + 100 (lead) = 300 m from start. From now Ram is half as fast as Shyam, so Shyam gains back the 300 m (that he is behind) in another 600 m. Totally, Shyam covered 300 + 600 = 900 m by the time they meet for the second time.

   $\Rightarrow$ They are 1000 - 900 = 100 m short of finish line.

6. Let the three consecutive even numbers be 2n - 2, 2n, 2n + 2

   Sum of their squares. $= (2n - 2)^2 + (2n)^2 + (2n + 2)^2 = 12n^2 + 8$

   This number when divided by 12 leaves a remainder 8.

   The other two statements may or may not be true.

7. $a_1 = 1$ and $a_1 + a_2 + \dots + a_n = n^2 a_n$ ....(1)

   $\Rightarrow a_1 + a_2 + \dots + a_{n-1} = a_n(n^2 - 1)$ ....(2)

   From (1), which holds for all $n \in N$, by taking n - 1 instead of n, we get

   $a_1 + a_2 + \dots + a_{n-1} = (n-1)^2 = (n-1)^2 a_{n-1}$ or $a_n = \dfrac{n-1}{n+1}$ for all n > 1.

   $\therefore a_{10} = \dfrac{9}{11} a_9 =$

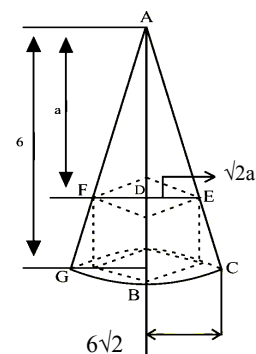 $= \left(\dfrac{9}{11}\right)\left(\dfrac{8}{10}\right) a_8 = \dots$

   $= \left(\dfrac{9}{11}\right)\left(\dfrac{8}{10}\right)\left(\dfrac{7}{9}\right)\left(\dfrac{6}{8}\right)\left(\dfrac{5}{7}\right)\left(\dfrac{4}{6}\right)\left(\dfrac{3}{5}\right)\left(\dfrac{2}{4}\right)\left(\dfrac{1}{3}\right) a_1$

   $= \dfrac{(2)(1)}{(11)(10)}(1) = \dfrac{1}{55}$

8. This question should be done by assuming a value of n as 1, 2, 3 and getting the answer.

9.

Let each side of the cube be a cm FE is the diagonal of one of the faces of the cube, and hence FE = $\sqrt{2}$ a

Since $\Delta AFE \sim \Delta AGC$

AD/AB = FE/GC

$$\frac{6-a}{6} = \frac{a\sqrt{2}}{12\sqrt{2}}$$

12 – 2a = a

12 = 3a

a = 4 cm

Volume of cube = 64 cm^3

Volume of cone = $1/3 \times \pi \times ((6\sqrt{2})^2 \times 6 = 144\pi$

$\therefore$ Volume of the remaining portion = 144π - 64

10. $((1 \times 7) + 4) \times 11 + 7 = 128$

When 128 is successively divided by 4, 7 and 11, the remainder are 0, 4 and 4.

$\therefore$ when 128 is divided successively by 4, 7, 11 the remainder in the division by 7 is 4,

11. <u>For the slow train.</u>

There are 19 halts $\Rightarrow$ there are 20 stretches on which the journey is undertaken. Since total distance is 60km, each stretch is 3 km long.

<u>For the fast trains</u>

There are 4 halts $\Rightarrow$ 5 stretches of journey $\Rightarrow$ each stretch is 12 km long,

Since the speed is 60 kmph, in one minute a distance of 1 km is covered.

Now it is to check from answer choices.

Choice	1	2	3	
Distance	42km	39km	40km	

<u>Fast train</u> Number of halts to be considered	3	3	3
Time taken for traveling + halts	42 + 3 = 45 min	39 + 3 = 42 min	40 + 3 = 43 min
<u>Slow train</u> Number of halts to be considered	13 or 14	12 or 13	13
Time taken for traveling + halts	42 + 13 = 55 or 42 + 14 = 56	39 + 12 = 51 or 39 + 13 = 52 min	40 + 13 = 53 min

Where the time travelled by fast train PLUS 10 minutes is equal to the time travelled by slow train when they meet. We find that it is happening in case of 2nd choice (52 minutes and 42 minutes). So, answer choice (2) [Note that it is happening in case of choice (1) also but it is because once the fast train catches up with slow train after 42 minutes, for the next 3 km, i.e., till slow train stops again, both the trains travel together.]

Solutions for questions 12 and 13:
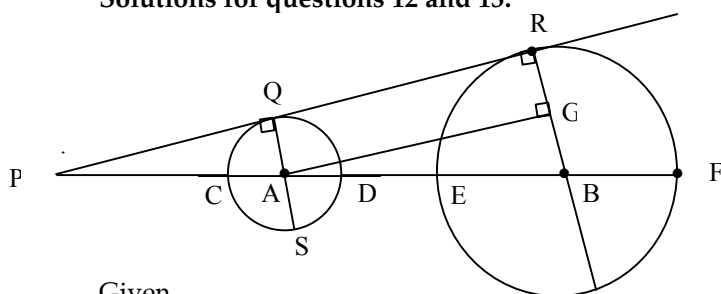
Given,

AB = 13cm; QR = 12cm; QS = 6cm ----- (1)

Let AG be perpendicular to RB,

Then, AQRG is a rectangle and, QR = AG = 12----- (2)

and AQ = GR = 3 -- - - (3)

In the right angled triangle AGB, AG = 12, AB = 13; hence GB=5 and RB = RG + GB $\Rightarrow$ RB = 3 + 5 = 8 - - - - (4)

ΔABG is similar to ΔPBR;

$$\Rightarrow \frac{PB}{AB} = \frac{RB}{GB} = \frac{8}{5} ----- (5)$$

12. PE = PB - EB = PB – 8 - - - -(1)

From the proportion mentioned above,

$$\frac{PB}{AB} = \frac{8}{5},$$

3

$$\Rightarrow PB = \frac{AB \times 8}{5}$$

$\Rightarrow PB = 104 \, /5 = 20.8 \, - - - - (2)$

Hence, PE = PB - 8 = 20.8 - 8 = 12.8 cm.

13. Area of triangles PAR and PBQ are to be compound.

$$\frac{\Delta PAR}{\Delta PBQ} = \frac{\frac{1}{2}.PR \times AQ}{\frac{1}{2}.PQ \times BR} = \left(\frac{PR}{PQ}\right)\left(\frac{AQ}{BR}\right)$$

$$= \frac{8}{3} \times \frac{3}{8} = 1$$

The two triangles are equal.

Solutions for questions 14 to 17:

We can solve this problem by using our understanding of divisibility rules.

Since, the first two digits from the left should be divisible by 2, we can have a number of combinations viz. 12, 14.16, 24, 26, 32, 34, 36, 42, 46, 52, 54, 56, 62, 64. But we see that the first five digits from left should be divisible by 5 and hence 5 cannot be in the first place from the left.

Also we have that the first 3 digits are divisible by 3.

⇒ The sum of 3 digits should be divisible by 3 The following numbers from the list would be left (for the first 3 digits) 123, 126, 162, 243, 246, 261, 264, 321, 324, 342, 423, 426, 462, 621, 624, 642 are left out.

Next condition is that the first four digits are divisible by 4. (i.e.) the last 2 digits of a four - digit number should be divisible by 4.

This now prunes our list to 1236, 1264, 1624, 2436, 3216, 4236

∴The six digit numbers are 123654, 126453, 162453, 243651, 321654, 423651

Now answering the four questions we get

14. Six
15. If 3 is in units place ⇒ the numbers are 126453 and 162453.
    The digit in hundred's place is 4.
16. As can be seen we can have 1, 2, 3 or 4 in the first position from the left,
17. If 4 is the digit in the second place from the left we are considering the number 243651.
    ∴The digit in the third place from the left is 3.

Solutions for questions 18 to 23:

18. (C) cost per call to the customer =

$$\frac{\text{Total Bill Amount}}{\text{No. of calls made}}$$

$$\therefore \frac{C_1}{C_2} = \frac{(500 + 0)/175}{(500 + 100)/350}$$

$$\therefore \frac{C_1}{C_2} = 5 : 3$$

19. Each term of the series is in the form of (1/two factors). The first factors of the denominators form one AP and the second factors form another AP. Hence, the general forms of the factors are:

(i) $5 + (x - 1) 3 = (3x + 2)$ and
(ii) $8 + (x - 1) 3 = (3x + 5)$

$$\Rightarrow t_x = \frac{1}{(3x + 2)(3x + 5)} \text{ when } x = 1, 2, 3, \rightarrow(1)$$

$$t_x = \frac{1}{(3x + 2)(3x + 5)} = \frac{1}{3}\left[\frac{(3x + 5) - (3x + 2)}{(3x + 2)(3x + 5)}\right]$$

$$= \frac{1}{3}\left[\frac{1}{3x + 2} - \frac{1}{3x + 5}\right] \rightarrow (3)$$
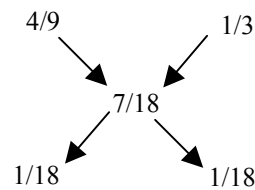
∴Sum of the given series

$$\frac{1}{3}\left[\frac{1}{5} - \frac{1}{8} + \frac{1}{8} - \frac{1}{11} \ldots \ldots + \frac{1}{242} - \frac{1}{245}\right]$$

$$= \frac{1}{3}\left[\frac{1}{5} - \frac{1}{245}\right] = \frac{1}{3} \times \frac{1}{5}\left[1 - \frac{1}{49}\right]$$

$$= \frac{48}{15 \times 49} = \frac{16}{245}$$

20.

	V_1	V_1
Q_1	4	5
Q_2	1	2
Q_3	7	11

∴ 1: 1   15 liters

21. We can have minimum surface area when all the dimensions of the cuboid are same.

	I	b	h	s
(1)	3	3	3	54
(2)	1	3	9	78
(3)	1	1	27	116

Hence, minimum surface is 2 (3 x 3 + 3 x 3 + 3 x 3) = 54 cm^2.

22. The roots of x^2 - 10x + 16 - 0 are x = 2, 8
Hence, roots of required equation = 1/4,1/64

Required equation is $x^2 - \dfrac{68}{256}x + \dfrac{1}{256} = 0$

or 256x − 68x + 1 = 0

23. The last four digits of the binary equivalent is to be determined.
This means that the remainder obtained when 4739685 is divided by 16 needs to be expressed.
To determine remainder of 4739685/16, It is enough that 9685 is divided by 16, and the remainder is obtained.
Remainder of (9685/16) is 5. 5 expressed in binary form of 4 digits is1010.

Solutions for questions 24 to 26:

By placing the points on a plane we see that E, C, D and B are all collinear and the arrangement is given in the figure. F lies on the circle shown.
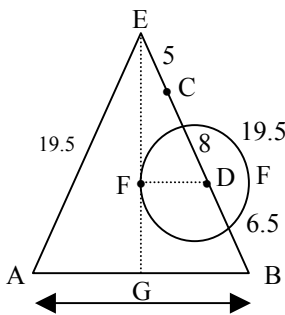
24. The number of triangles is maximum, when F is not collinear with E, C, D and B.
Then $^6C_3$ - $^4C_3$ = 20 - 4 = 16

25. The area of ΔDEF will be maximum when DF (= 5 units) is ⊥ to ED (which is 13 units)
Then area = 1/2 x DF x ED = 1/2 x 5 x 13 = 32.5 sq. units

26. If F is equidistant from A and B, then F lies on the median EG. (Note that ABE is isosceles)

Since $\dfrac{ED}{EB} = \dfrac{5+8}{19.5} = \dfrac{13}{19.5} = \dfrac{2}{3}$

DF to EG (i.e. perpendicular distance) will

be $\dfrac{2}{3} \times \dfrac{15}{2}$ = 5 units ⇒ The circle touches EG

at only one point. ⇒ only one possibility for F.

27. Let the amount that Anil borrowed be P. At present the amount that he owes (A$_1$) is 150% of P. i.e. A1 = (1.5) P

28. One could guess the answer as 10% at step

(1) itself because $1 + \dfrac{10}{100}$ =1.1 and $(1.1)^3$ = 1331 and then substitute to check.

29. In a square, the diagonals perpendicularly bisect each other. As the diagonals are coinciding with the two axes of x and y, all the four vertices lie on the four segments of the axes.
Side PQ is represented by the equation x + y + 3 = 0. RS is the side opposite to PQ and so PQ is parallel to RS.
The equation of the two lines parallel to each other differ only in the independent term.
The equation x + y + 3=0 can be written as x/-3 + y/-3 = 1; i.e. the line makes intercepts of − 3 and − 3 on the x and y − axes respectively.
As all the four vertices are equidistant from the point of intersection of the diagonals, the other two vertices must be at distances of 3 and 3 from the point of intersection of the diagonals (i.e., the origin) hence the equation of the side parallel to PQ (i.e. RS) = x/3 + x/3 = 1; or x + y − 3 = 0

30. Remainder
= (1333 mod 12) ×(1335 mod 12) × (1337 mod 12)
= (1× 3 × 5)= 15 mod12 = 3.

31. $a^2 + b^2 + c^2 + - 2ab - 2bc - 2ca = 0$
$\Rightarrow (a - b)^2 + (b - c)^2 + (c - 1)^2 = 0$
$\Rightarrow a = b = c.$

32. abc is always odd while ab + bc+ ca is odd ab + bc+ a + b is even because all the four terms are odd.

33. I Last digit 8 – possible ways - 9× 9× 9 - 729
II. Last digit not 8 – 4 × 9 × 9× 3

```
                 - 972
                ----------
                  1701
                - - - -- -
```

the first three digits can be 535 or 553.
∴1701 × 2 = 3402 ways.

34. g (2,1) = g(g(1,1),0) = g(1,1) +1
g (1,1) = g((0,1),0) = g(0,1) + 1 = 3
g (2,1) = 3 +1 = 4

35. Given that $\dfrac{x+3x-10}{x-5x-14}$ is positive $\Rightarrow$

$\dfrac{(x+5)(x-2)}{(x-7)(x+2)} > 0$

Case 1:
$(x+5)(x-2) > 0$ and $(x-7)(x+2) > 0$

Case 2:
$(x+5)(x-2) < 0$ and $(x-7)(x+2) < 0$

Case 1:
$(x+5)(x-2) > 0$ and $(x-7)(x+2) > 0$
$\Rightarrow x < -5$ or $x > 2$ and $x < -2$ or $x > 7$
$\Rightarrow x < -5$ or $x > 7$
However, $|x| < 4$, therefore, none of the above two solutions is admissible.

Case 2:
$(x+5)(x-2) < 0$ and $(x-7)(x+2) < 0$
$-5 < x < 2$ and then $|x| < 4$ is also satisfied by the above range.
Hence, range of real values of x, with $|x| < 4$ is $-2 < x < 2$

36. Let the man buys x trees & let the length of the side of his house be L

$x = \dfrac{L}{10} + 1$

$x = \dfrac{L}{8} + 1 - 6 = \dfrac{L}{8} - 5$

$10(x-1) = 8(x+5) \Rightarrow 2x = 50 \Rightarrow x = 25$
$L = 240$.

37.

1							3		3
2		1			2		2		2
3		2	1	2	1		1		1
4		4	3	4	3	4	3	4		4
A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**

$\therefore$ 5 steps.

Solutions for questions 38 and 39:

$(x, y) = x/y$

$\$(x, y) = \dfrac{x+y}{2}$

$\&(x, y) = \dfrac{x}{2}$

38. $2x \$ (x, y) = 2x \dfrac{x+y}{2} = x + y$

39. Simplifying choice (2) we get

$\&\left(\#\left(2, \dfrac{x+y+z}{2}\right)\right)3. = \&(x+y+z, 3)$

$= \dfrac{x+y+z}{3}$

Solutions for questions 40 to 43:

40. In the first stage, each group has 8 teams and in each group a total of $^8C_2$ games are played.
$\therefore$ In the first stage, the total games are $2 \times {}^8C_2 = 56$.
In the second round there are a total of 8 teams. The number of games played are

```
      8
4         4 - - - - - 4 games
|         |
2         2 - - - - - 2 games
|         |
1         1 - - - - - 1 game
          -----------7 games
```

$\therefore$ Total number of games are $56 + 7 = 63$ games.

41. To ensure that a team goes through to the second round let us assume the most possible scenario.
(1) Let five teams get 6 points each.
i.e. $5 \times 6 = 30$ points, but only $^8C_2 = 28$ points are possible in 28 matches.
(2) Let five teams get 5 points each. This is a possible case, since $5 \times 5 = 25$ and $25 < 28$ Consider the table of outcomes given below: Let the teams in a group be A, B, C, D, E, F, G and H:

	A	B	C	D	E	F	G	H
A	X							
B	A	X						
C	A	B	X					
D	D	B	C	X				
E	E	E	C	D	X			
F	A	B	C	D	E	X		
G	A	B	C	D	E	F	X	
H	A	B	C	D	E	H	G	X

In the above scenario, A, B, C, D and E all have 5 points each and it is hence uncertain for any team to make it into the next round even after winning 5 points.
$\therefore$ minimum 6 points can guarantee a place in the next round.

42. From above solution we get that a team could possibly not make it into the next round inspite of winning 5 points.

43. Since the winning team could have come into the second round after having won either 4, 5, 6 or 7 matches.
∴ we cannot be certain about the number of matches it won.

Solutions for questions 44 to 50:

44. Let the capacity of the first tap be 1.
⇒ The capacity of the other taps = 2, 3, ... till 10.

⇒ total capacity of tank = $\left(\sum\limits_{1}^{10} n\right) \times 5$ hours

= 275

But the sum $\sum\limits_{10} n + \sum\limits_{9} n + ... + \sum\limits_{1} n = 220$

i.e. 56 + 45 + 36 + 28 + 21 + 15 + 10 + 6 + 3 + 1 = 220

(This is since the taps are closed in the specified order)

∴ at the end of the tenth hour, all taps are closed though the tank is not yet full.

∴ The tank will never be filled.

45. The percentage of people in the age group of 25 years to 60 years is 86-37 = 49% of total population Illiterate and literate are in the ratio of 7 : 3. "

Hence, percentage of illiterate people in the referred age group 7/10 x 49% of population = 34.3% of total population. Given that illiterate people number = 24,010 Hence. 34.3% of population = 24, 010

⇒ population = 24010/34.3% = (24010/34.3) x 100 = 70,000

46. $\dfrac{(x-1)(x+4)(x+2)}{(x-3)(x+8)(x+3)} < 0,$

we only need to check for integers from -9 to +4, with the exclusion of the roots, i.e. with the exclusion of x = - 8, - 4, - 3, - 2, 1, 3 The integer solution set is { - 7, - 6, - 5 and 2} i.e. four in number.

47. We form the trapezium ABCD with
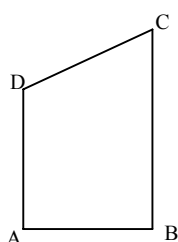
AB = 2, BC = 9 and AD = 4. The area of the trapezium is 1/2 x 2 x (4 + 9) = 13 sq. units Trapezium is the area which just over estimates the shaded portion. Hence 13 sq. units is the closest among the choices.

48. The remainder of (abc/d) is same as the remainder of the division $(r_1.r_2.r_3/d)$ where $r_1 \ r_2, \ r_3$ are respective remainders. When a, b, c are divided by 'd'. By actual division 673/17, leaves a remainder of 10. Similarly r_2 can be calculated, and r_2 = 10 and r_3 is also equal to 10 i.e. $r_1 = r_2 = r_3$ =10 The remainder of the division $(r_1r_2r_3/d)$ = (10x10x10/17) By actual division, the remainder is 14.

49. The area of triangle MPN can be calculated in 2 ways,
(a) as 1/2 MN. PQ
(b) as 1/2 PN. ML Hence, those two are equal ⇒ MN. PQ = PN. ML⇒ 36 x 4 = PN x 18⇒ PN = 8cm
<u>Alternately</u>
ΔMLN and ΔPQN are similar (AAA similarity)

$\Rightarrow \dfrac{PN}{MN} = \dfrac{PQ}{LM} \Rightarrow PN = \dfrac{36}{18} \times 4 = 8\,cm$

50. We have to find the number of co-primes of 21600, which are less than 21600 excluding 1.
$21600 = 6^3 x \ 10^2 = 2^3 x \ 3^3 x \ 2^2 x \ 5^2$
∴ Number of co - primes = 21600 x (1 - 1/2) x (1 - 1/3) x (1 - 1/5)
= 21600 x 1/2 X 2/3 x 4/5 = 5760
∴ 1 is to be excluded = 5759

51. Statements 2, 3 and 4 are possible solutions to the culture of dominance.

52. The answer is in para 8.

53. Statement A is from para 5, B is from para 6, C is from para 7. Statement D is not mentioned at all.

54. The question is from para 8.

55. It is from para 4.

56. The question is from para 2.

57. The question is from para 8.

58. Choice (1) is from para 6, (2) is from para 7, (3) is from para 4. so (4) is wrong as per para 3.

59. Para l

60. Para 3.

61. Statement A is from para 2, C is from para 4, D is from para 1. Statement C is false as per para 5.
62. Para 8.
63. Statement A is from para 4, B is from para 5, C is from para 6 and D is from para 7.

64. Para 5 states that babies judge the whole world from their own standpoint.

65. Para 3 clearly states that the sense universe is a part of the infinite spiritual universe and you can't understand it without knowing the beyond.
66. Choice C (though true) is not a concept of religion. A and B are stated in para 4 and D in para 5.
67. "Infinite spiritual universe projected into the plane of consciousness" means applying the spiritual universe to the sense universe.
68. In para 2, the second line says, "Why struggle for that infinite unknown"
69. Sir Martin has not colluded (conspired) with the publishers; so (4) can be ruled out- The intention is not to deceive the public - can be ruled out. Choice (2), though true, is not in itself a sin. Choice (1) states clearly Sir Martin's 'sin' - the desire to arouse interest to gain readership.
70. The 'invisible hand' does not refer to the policies made (choice 1) nor to the pollution (2) It refers to the present state of the market (not environment as stated in choice (4)) that has led to environmental degradation.
71. Para 7 says we can't draw lines between people and the animal and plant worlds (supports a). The same para says, "...biodiversity can pay for itself through benign systems of sustainable extraction ...." (supports b and c).
72. Para 9 supports all the choices.
73. Choice (a) is stated in para 2 and choice (b) is stated in para 4. Choice (c) is false because Mr. Ian Swingland edited the articles (we do not know if he was a scientist at the Royal Society). Choice (d) is also false because the passage says the greens were against genetically modified crops (not necessarily against everything that is not natural).
74. Statement A is true as per para 1, B is true as per para 2. Statements C and D are not true.

75. The question is from para 6. Statements A, B and C are true. Statement D is false.

76. Choice (1) is from para 4, (2) is from para 6 and (3) is from para 3. Hence all are true.

Solutions for questions 77 to 81:

77. Investigation produced a number of results, hence the word is array (display or range) not irony (ill tuned arrival) or iota (small amount) or eon (long period).

78. Microbiologists cultured (grew) the bacteria - cultured is the word normally used for the growing of bacteria or viruses under controlled conditions in a laboratory. They did not investigate (examine) or nurture (process of bringing up or injecting drive or force) the bacteria.
79. The bacteria had managed to live for 11,600 years in an oxygen - free environment. This idea is conveyed by survived (continued to live or exist) not subsisted (kept oneself alive), multiplied (increased in number - not specified) or thrived (flourished).

80. The kings were allowed a free rein (the power to direct and control), though monarchs reign, as the noun reign means 'the period of rule'. Relativism is a doctrine and reinforcement means strengthening.
81. The words that follow the blank (ultimate neglect) suggest that the word in the blank is obsolescence (became obsolete). It cannot be observation (process of observing) or obscurantism (the practice of preventing facts from being known) or oblivion (the state of being unaware of what is happening around one).

Solutions for questions 82 to 86:

82. D is the appropriate statement to begin the paragraph. D says Sadruddin returned to the UN in times of crisis. A follows D. The idea expressed in D finds a continuation in A. Further, C says around that time, stories circulated that the Prince was a secret agent for the British The words "that time" in C refer to the point that the UN vetoed his candidature again in 1991. Hence DAC is the better combination. Subsequently, BE follow. Hence answer is choice (1).

83. Statement A opens the paragraph. It says people involved in business are subjected to the whims of the economy.
A is followed by C which says the only constant in business is "change". The word "change" in C finds a continuation in D. The words "pervasive market fluctuation" talk about economic uncertainty in business. Further, BE are the concluding statements. Thus answer choice is (2).

84. D is the appropriate statement to open the paragraph. It says art and money do not go together. E is the better statement to follow D. It says that these days, the principle function of art is the absorption of excess cash. Subsequently the idea of art and money being partners in the grandest scam in modern history is expressed in B. Further A and C give examples of the ideas expressed in DEB. is the appropriate choice.

85. C can open the paragraph. C says job insecurity has intensified across all sections, B is a better choice to follow C. B says it led to employment insecurity and economic insecurity. Further EA go together. In statements ADF we find a reference to the "organized sector", i.e., the idea expressed in A is continued in D and F.

86. From the given statements C is the appropriate statement to open the paragraph. Statements E and G begin with a pronoun, hence cannot open the paragraph. F may open the paragraph, but A cannot follow F. A says,"It attacks a temple in Ahmedabad". It is not logically related with statement F. Hence choice (4) is ruled out. Thus answer is choice (3).

Solutions for questions 87 to 91:

87. From the given choices (1) is the correct sentence.
In statement B, the error is in the usage of the preposition.
"In the American University at Cairo" is incorrect.
"A the American University in Cairo" is correct.
Again, in B, the part of the sentence, "..cobbler's day has been like..." is erroneous.

The correct form is, "cobbler's day had been like, ...,"
[The given sentence is in past perfect tense, it cannot take a verb in present perfect tense.
In statements C and D the usage of "commute on a bus over flown with the workers ..,......." is erroneous. (fly, flew, flown)
Here, according to the context, the bus was overflowing with passengers.
is the correct choice.

88. From the given choices (3) is the appropriate choice. In statement A, "setting on" is incorrect. Set on means cause to attack. The correct usage is "setting out", i.e., to start a journey.
In statements A and C the part of the sentence " .... vastness of the land and philosophy ...." is incorrect.
The correct form is "......... vastness of the land and of a philosophy" (condition of parallelism).

89. Among the choices (1) is the appropriate choice.
In B and D, "dearth in peace initiatives" is incorrect. The correct form is "dearth of peace initiatives" (i.e., scarcity of ....). In B and C, "all plans fell apart" is incorrect. The correct form is "all plans fell through," which means "failed" (fell apart means "disintegrated" which does not suit the context). Hence the appropriate choice is (1)

90. Among the given choices (1) is the most appropriate answer.
In statement B, "much of the spending has been by the government, with result of poor profitability" is erroneous. The correct form is "much of the spending has been by the government, resulting in poor profitability", (i.e., the spending by the government has resulted in poor profitability).
Again in A and C we find the usage, "rather than those of......." which is incorrect. The correct form is "rather than that of ....". The comparison is between the spending by the government and the market. Thus answer is choice (4).

91. From the given choices (3) is the most appropriate choice.
"Her wealth of resources and matchless opulence in spirit ...." is erroneous.
Opulence of spirit is correct. This error is

found in sentences A and B. Again, "her wealth of resources and matchless opulence of spirit remained in political bondage, <u>which</u> very fact........" is incorrect. The correct form is "....... the political bondage, that very fact........". is the appropriate choice.

Solutions for questions 92 to 95:

92.   From the given paragraph we understand there is a lot of variation in the number of child laborers. The most appropriate reason for this could be a lack of clarity on the question of who constitutes a child labor. This idea is expressed in choice (4).

93.   The given para says that shaping economic policy is more about conflict management, i.e., a policy which reflects the continuing compromises in economic decision-making between the demands of an ordinary person and the demands of a particular section of the society. The emphasis is on conflict management, i.e., the demands of the populist and the sectional interest demands are in conflict.

94.   The given paragraph says that institutions are creative acts and the institutions created by many great people in the past reflect their creative endeavor. But they did not think of the ways of making them everlasting. Hence the appropriate answer is (3). Choice (1) is not the appropriate answer through it appears to be so. It generalizes the statement, but in the given context we are talking about institution-builders in particular.

95.   From the given para we can infer that the new image
managers are focussed on improving images. Choice (3) expresses the above idea.

Solutions for questions 96 to 100:

96.   From the choices it is understood that A matches with E. The meaning expressed in B matches with H. This combination is found in choices (3) and (4). The meaning expressed in B is "to decide a limit for something", which is implied by H. The meaning expressed in C, i.e., to arrange an election, game, etc. dishonestly, is implied by G.

97.   The meaning expressed in A is "to deal with a difficult situation", which is implied

in F. Hence AF is correct. The meaning given in B is to control the movement of a vehicle, tool, etc. It is implied by H.
The combination of AF is found only in (2), BH is found in (2), (3), (4).
Further, the meaning expressed in C matches with G. It is found in (2) and (3). Since the combination of AF is found only in choice (2), it is the appropriate answer.

98.   From the given meanings it is clear that the meaning expressed in D is implied by E. C says 'quick' is the ability to learn and understand things fast. The meaning is implied by A, i.e., D matches with E and C matches with H. A says 'quick' means continuing or existing for only a short time, which is implied in F, i.e., "a series of interviews which occurred for a short time ..." i.e., B matches with F. These linkages are found in (3).

99.   The meaning expressed in A is implied by H. The combination is found in (1) and (4), The meaning expressed in B, i.e., "a mine" is implied by G. BG is found only in choice (1). Hence choice (1) is the appropriate answer.

100.   A says 'quiet' means not making much noise, which is implied by H. A matches with H. The meaning expressed in B is 'a peaceful place' which is implied by E, i.e., B matches with E.
AH and BE are found only in choice (1). Hence the appropriate answer is (1).

Solution for 101 to 105

The amount of water filled or emptied by each tap is given by the area under the graph for each tap.
For example, the amount of water filled by tap A in the first 5 minutes = Area under the graph between $t = 0$ and $t = 5$
i.e. Area of the triangle = $1/2 \times 5 \times 25$ = 62.5litres
Alternately, the area can also be calculated by simply counting the number of squares under the graph as each square is equivalent to 25litres.
The above mentioned triangle is equal to 2.5 squares.
∴ Area = 2.5 x 25 = 62.5litres

101.   The water level will rise if the area under the graph for tap A is more than that of area under the graph for tap B, otherwise it will fall.
Taking choice by choice
Choice (1) 0-5 minutes

Amount of water filled by tap A = Area under the graph for tap A = 2.5 squares

For tap B, the area = 1 square

∴ water level will rise by an amount equivalent to the area of 2.5- 1 = 1.5 squares. Choice (2) 25-30 minutes

Area under the graph for tap A = 7 squares and for tap B = 4 squares

∴ the water level will rise

rise = area of 7 - 4 = 3 squares

Choice (3) 20-25 minutes

Area under the graph for tap A = 7 squares and for tap B = 3.5 squares

∴ water level will rise by an amount equal to area of 3.5 squares (7 - 3.5).

Choice (4) 50 - 60 minutes

Area under the graph for tap A = 8.5 squares

Area under the graph for tap B = 11 5 squares

∴ water level will fall by an amount equal to area = 11.5 - 8.5 = 3 squares.

(Note: to calculate the actual rise/fall in water level, we need to multiplying the number of squares with 25litre)

102. This will be given by the area under the graph for tap B from t = 0 to t = 50 minutes

t = 0 to t = 5 ⇒ 1 square
t = 5 to t = 10 ⇒ 1.5 squares
t = 10 to t = 20 ⇒ 5 squares
t = 20 to t = 25 ⇒ 3.5 squares
t = 25 to t = 30 ⇒ 4 squares
t = 30 to t = 40 ⇒ 12 squares
t = 40 to t = 50 ⇒ 15 squares

Total =1 +1.5 + 5 + 3.5 + 4 + 12 + 15 = 42 squares

= 42 × 25 = 1050 litres

103. This is best done by considering each answer choice separately. At the end of t = 25 minutes.

Area under the graph for tap A = 23 squares and for tap B = 11 squares.

∴ Total area = 34 squares

Hence amount of water filled = 34 x 25 = 850 litres Obviously, the tank is not filled from t = 0 to t = 25 minutes.

From t= 25 to t = 30

Area under the graph for tap A = 7 squares and for tap B = 4 squares.

So, additional volume filled by the two taps = 11 x 25 = 275litres

So, at t = 30

850 + 275 = 1125litres will be filled which is equal to the capacity of the tank.

104. Area under the graph for tap A.

from t = 0 to t = 5 ⇒ 2.5 squares
t = 5 to t = 1 0 ⇒ 5 squares
t =10 to t = 15 ⇒ 4 squares
∴ t = 15 to t = 20⇒ 4. 5 squares

∴ Area under the graph from t = 0 to t = 17½ = 1 3.75 squares = 13.75 x 25 = 343.75 litres

For tap B.

from t = 0 to t = 5 ⇒ 1 square
t = 5 to t = 10 ⇒ 1.5 squares
t = 10 to t = 17½

$$\Rightarrow \left(1.5 + \frac{1}{2} \times 1.5 \times 3\left(\frac{1.5}{2}\right)\right) \cong 3.2$$

∴ Area under the graph from t = 0 to t = 17½ ≅ 5.7 (i.e. 1.5 +1 +3.2)

= 5.7 x 25 = 142.5litres

∴ Capacity of the tank = 343 + 142.5 = 486litres.

105. From solution to question (103), we know that by the 30th minute, tap A can fill 750litres while tap B can fill 375litres. Hence, from the diagram, tap A in the next 5 minutes will fill exactly water equivalent to 6 squares on the graph = 6 x 25 = 150litres

∴ (Total of 900litres)

Similarly tap B in the next 5 minutes can fill water equivalent to 5.5 squares = 5.5 x 25 = 137.5litres

∴ (Total of 512.5litres)

So, T_1 is filled while T_2 is not.

Solutions for questions 106 to 110:

106. From observation, the number of students getting IIMC but not IIMA is (6 + 15+ 11 + 5) = 37

Out of which 6 got IIMB but not L and (5 + 11) got L but not B.

Since we need B or L, both these figures are taken.

107. First the complete Triangle has to be discounted then we have (IIMA ∪IIMI) ∩ (IIMB∪IIMC)

we get (12 + 8 + 6 + 5 + 2) = 33

108. Exactly two or exactly three

= at least two - exactly five - exactly four

⇒ at least two = 119 (from soln 110)

⇒ exactly five = 7 (from figure)

⇒ exactly four = 25 (from soln 109)

∴119 – 7 – 25 = 119 - 32 = 87

109. Exactly four

⇒ all except IIMA = none

⇒ all except IIMB = 16

⇒ all except IIMC = none
⇒ all except IIML = 5
⇒ all except IIMI = 4
∴ 16 + 5 + 4 = 25

110. Students getting admission in at least two colleges
= Total number of students (who got at least one admission) - Total number of students getting exactly one admission = 200 - (22 + 14 + 15 + 6 + 24) = 200 - 81 = 119

Solutions for questions 111 to 113:

From (3) we get K is the father of H and H is K's son.
I and L belongs to the same family means I is the mother and
L is her son.
But I and L do not belong to K's family because in a family
there should not be two boys.
J, C and M belong to same family means M is the mother; J
is her son and C is her Daughter.
G and O belong to the same family but H is not the brother of
O means G and O belong to separate families where N is the
son, O is the daughter and G is their mother.
B and E belong to the same family means E is the daughter
and her father is B.
P is the wife of K and A is their daughter.
From (4) we get, D is the husband of M and F is the husband
of G.
The four families are
K, P, H and A
B, I, L and E
D, M, J and C
F, G, N and O
From (1) and (2) we can infer that
In each row and in each column there should be a father, a mother, a boy and a daughter but none of them should" belong to the same family.
From (6) we get K sits in the 4th row 1st column; G sits in the 2nd row 2nd column; J's mother sits in the 4th row means she cannot sit in the 1st column, 2nd column and in the 3rd column.
Hence M sits in the 4th row 4th column.

A boy and a girl always sit adjacent to each other implies I sits in the 3rd row 1st column and P sits in the 1st row 3rd column.
D sits in the 1st row 2nd column,
B sits in the 2nd row 3rd column and
F sits in the 3rd row 4th column
The arrangement is as follows:

111. Since we have already arranged all the parents, clearly (A) and (B) are redundant, hence the answer must be only (C) (since there is no choice that says data inadequate).
Alternately;
From A, we get F sits in the 3rd row 4th column is known.
From B, we get P sits in the 1st row 3rd column is also known.
From C, we get O sits in the 4th row 3rd column, by this arrangement we get

N	D	P	E
C	G	B	H
1	A	J	F
K	L	O	M

Hence, from C, alone we can determine the positions of all the sixteen members.

112. If it is given that K's daughter sits in the 4th column, then the arrangement we get is as follows.

O	D	P	L
J	G	B	A
1	H	C	F
K	E	N	M

Hence, they sit in only one way

113. From the earlier solutions we get FGNO is the correct family.

N/O	D	P	L/E
J/C	G	B	H/A
I	H/A	J/C	F
K	L/A	N/O	M

Solutions for questions 114 and 115:

From (1), we get sphere is made of diamond.
From (2), we get cube is 3rd in weight and 4th in cost i.e., the cost of the cube is 1000/-
From (5), we get Pyramid is green in colour and is manufactured through the process of moulding. Hence, cone is made through the process of casting.
From (3), we get cube is made of Kryptonite and is manufactured through the process of cutting. We can infer that pyramid is made of glass and cone is made of wood and is in black colour.

The final arrangement we get is as follows.

Solid	Colour	Material	Process	Weight	Cost
Sphere		Diamon	Forging		
Cube		Kryptoni	Cutting	2kg	1000
Pyram	Green	Glass	Mouldi		
Cone	Black	Wood	Casting		

114. If it is given that the solid made of Diamond is the heaviest but is not white then the arrangement we get is as follows

Solid	Colour	Material	Process	Weight	Cost
Sphere	Yellow	Diamond	Forging	4kg	1 trillion
Cube	White	Kryptonite	Cutting	2kg	1000/-
Pyramid	Green	Glass	Moulding	3kg	1 million
Cone	Black	Wood	Casting	1kg	1 billion

'The sphere which is made of Diamond is yellow in colour and is manufactured through the process of forging" is definitely true.

115. The cone is made of wood and is manufactured through the process of casting.

Solutions for questions 116 to 118:

116. If the year starts and ends with the same day means the year is not a leap year. is definitely true. In a non leap year the calendar of January matches with that of October. is definitely true. In a leap year the calendar of July matches with that of October but the year is not a leap year. is definitely false.

117. It is given that either B or A sits to the immediate right of D. It is also given that two people sit in between B and D, hence B does not sit to the immediate right of D. So, A sits to the immediate right of D If A sits to the immediate right of D, then the possible arrangements are
D A _ _ _ _ G _ → (1)
G _ _ _ _ D A → (2)
_ D A _ _ _ G → (3)
(1) & (2) can be ruled out because three people sit in between A and G and three people sit between B and E and four people sit in between C and E.
Considering (3), we get
E D A F B C G.

Hence, F sits exactly at the middle of the row.

118. The person who starts, if he leaves exactly 12km (i.e. (10 + 2) km) for the other person, then he will always win.
Choice (1): 1008 is it self a multiple of 12 hence Manoj cannot win.
Choice (2): since we do not know who starts the game, this cannot be the answer.
Choice (3): since 1001 is not a multiple of 12 the person starting the game will win the game.

Solutions for questions 119 and 120:

119. Let us note down the given conditions as
Student	Prize got	Prize intended
D→	Q	not Q
B→	S	S
C→	N	M
G→	X (say)	X (say)
E→	R	not N
F→	O	

Further who ever should have got Q did not get R
Now we can say X = P

	A	B	C	D	E	F	G
Intended		S	M				P
Received		S	N	Q	R	O	P

Now A must have received M and hence N could not have been intended for him ...... (2) also E was not supposed to get N and also since E got R he should not possibly deserve Q. (from (1))
∴For E. we can see that the following are not possible prize intended for him
Q, N, S, M or P => E deserved O or R.
Now only prizes left to fill the boxes in the first row of the table under A, D and F are N, R, O and Q.
Further from (2) we get A deserved O, R or Q. If A deserved O or R, then F deserved Q and D deserved N which is a possibility. And since A got M he could not have deserved Q.
∴The final distribution is

A	B	C	D	E	F	G
R/O	S	M	N	O/R	Q	P
M	S	N	Q	R	O	P

The person supposed to receive N got Q.

120. From the above solution E should get O and A should get R. Hence A who deserved R finally got M.

Solutions for questions 121 to 126:

121. Total salary = Average salary x Total number of employees.
For Infogyst = 27531×3743
by rounding off to the nearest thousand we get
$28 \times 4 = 112$
Similarly,
For Saika = $26 \times 5 = 130$
For Marino = $22 \times 7 = 154$
For Lilips = $31 \times 2 = 62$
Marino is the highest.

122. By keen observation we find the given conditions is satisfied for SVT, Info, Cyndel, Marino, Nithyam, Fedez and Nicolas. Total of 7 companies.

123. Given that 1% of the total revenue = 36487×17329
By rounding off, 1% = 36000×17000
100% of revenue =
$100 \times 36000 \times 17000 = Rs.612 \times 10^8 = 61.2$ crores
Similarly 0.16% of expenses = 18000×32
100% of expenses = 36×10^7 crores = 36.0 crores
Gross profit = $61.2 - 36 = 25.2$ crores (approximately)

124. Except in the Advertisement departments of the 11 companies, the numerical value of the employees in the other five departments will be more than the numerical value of average salaries of the respective department. There are a total of 11 instances.

125. By observation we find that the total salary of either SVT Technology or the Lilips should be the least.
SVT = 17×21643
By rounding off $17 \times 22 = 374$
Lilips = 18×19421
By rounding off $18 \times 19 = 342$

126. By rounding off to the nearest thousand, the total lumber of employees of Cyndel = $43.1 + 1.6 + 0.6 + 4.1 + 0.3 = 49.7$
HMLC = $36.5 + 1.1 + 0.5 + 4.8 + 0.3 = 43.2$
Fedez = $41.4 + 3.7 + 0.4 + 4.8 + 0.4 = 50.7$
Nithyam = $49.1 + 2.4 + 0.8 + 5.1 + 0.5 = 57.9$
The ascending order is bacd.
Alternately,

by observation Nithyam is the highest and HMLC the least. Answer could be choice (1) or choice (2). Now since a > c, answer should be choice (1)

Solutions for questions 127 to 131:

127. Profit after tax = Number of shares x EPS = $90,000 \times 5 = 4,50,000$
Profit before tax = $\dfrac{4,50,000}{0.6} = 7,50,000$
Total expenditure = $10,00,000 - 7,50,000 = 2,50,000$

128. Since $\dfrac{5}{10} > \dfrac{7}{15} > \dfrac{5}{25}$
Profitability is the highest for company A.

129. The question cannot be answered with given data since only percentages are given.

130.

	Last Year (LY)	This Year (TY)
No. Shares	75000	75000
EPS	5	7 (40% increase)
PAT	3.75 lakhs	5.25 lakhs
PBT	3.75/0.5 = 7.5 lakhs	5.25/0.6 = 8.75 lakhs
Expenditure	6.25 lakhs (Same)	15 – 8.75 = 6.25 lakhs
Revenue	13.75 lakhs	15 lakhs

Percentage increase in Revenue from LY to TY
$= \dfrac{1.25}{13.75} \times 100 \cong \dfrac{5}{55} \times 100 \cong 9\%$

131. Total earnings = $1000 \times 5 + 1000 \times 7 + 1000 \times 5 = 17,000$.

Solutions for questions 132 to 137:

132. Capacity of M_1 = 12000 tons of ore.
It can dispatch a maximum of 4800 tons to P_2 at zero cost (Because the cost of transportation from M_1 to P_2, from table 1, is zero)
Similarly, of the remaining 7200 tons of Ore, a maximum of 3200 tons can be dispatched to P_2 at Rs.15,000 per ton and the remaining 4000 tons can be dispatched to P_3 at Rs.20,000 per ton.
$\therefore$ total cost (in Rs. thousands)
$= 3200 \times 15 + 4000 \times 20$
$= 48,000 + 80,000 = 1,28,000$

133. Requirement at D_4 = 1500 tons.
The Ore from M_2 can come to D_4 through any of the
Plants P_1 to P_5.
Let O_i be the cost per ton of transporting Ore from M_2 to P_i and S_i be the cost per ton of transporting Steel from P_i to D_4 then we need to maximise $C_i = 4O_i + S_i$ (Since four tons of Ore are involved in making 1 ton of steel)

i	C_i
1	160→(30 × 4 + 40)
2	80 →(15 × 4 +20)
3	15 →(0 × 4 +15)
4	80 →(20 × 4 +0)

125 →(25 × 4 +25)
also checking that for any P_i the capacity C_1 is maximum but only 1000 tons can be met from P_1 and the remaining being met from P_3.
∴total overall cost per ton
$= \dfrac{160 \times 1000 + 125 \times 500}{1000 + 500}$
= 148 (Rs. thousands)

134. This problem is very similar to the earlier except that the mine/s from where the ore is supplied to P_i is/are to be decided so as to minimise the overall cost of transportation per ton of steel,
∴$Ci = 4O_i + S_i$ note: $S_i = P_1$ to $D_3 = 35$

i	C_i
1	195→(40 × 4 + 35)
2	155 →(30 × 4 +35)
3	135 →(25 × 4 +35)
4	155 →(30 × 4 +35)

∴least is 135 for M_3. Checking capacity of M_3 and P_1 to supply to D_3 we see that they are adequate.

135. For the steel stored at D_4, we need the details regarding the plants and mines from where the requirements are met, without which we cannot find the required answer.

136. The initial glance at the table shows that all plants expect P_1 can potentially get ore at zero transportation cost, but since the complete capacity has to be met at all the plants (at zero cost) we see that M_2 cannot fully meet P_3's requirement.

∴except P_1 and P_3, we can have zero cost of transportation for ore at three plants, P_2 P_4 and P_5.

137. For the overall cost to be zero the cost of transporting ore as well as cost of transporting steel must be zero.
⇒From the above solution we need to took at only P_2, P_4 and P_5 each of which can potentially supply steel to D_2, D_4 and D_5 respectively at zero cost. But as can be seen P_2, P_4 and P_5 fall short of the requirements. Therefore no depot can get steel at zero overall cost.

Solutions for questions 138 to 142:

138. 1993-94, percentage increase =
$\dfrac{10500 - 9200}{9200} \times 100$
$= \dfrac{1300}{9200} \times 100$
$\cong \dfrac{13}{91} \times 100 \cong 14\%$
1994 – 95, percentage increase=
$\dfrac{13250 - 10500}{10500} \times 100$
$= \dfrac{2750}{10500} \times 100$
$\cong \dfrac{275}{1050} \times 100 \cong 25\%$
1995 – 96 cannot be found.

139. In 1993 – 94, percentage increase =
$\dfrac{9500 - 7870}{7870} \times 100$
$= \dfrac{1630}{7870} \times 100$
$\cong \dfrac{16}{79} \times 100 \cong 20\%$
In 1994 – 95, percentage increase=
$\dfrac{10925 - 9500}{9500} \times 100$
$= \dfrac{1425}{9500} \times 100$
$\cong \dfrac{14}{95} \times 100 \cong 15\%$
In 1995 – 96 , percentage increase =
$\dfrac{13500 - 10925}{10925} \times 100$

$$= \frac{2575}{10925} \times 100 \cong \frac{25}{100} \times 100 \cong 25\%$$

140. In 1994-95 budgeted, required ratio = 12480 : 10925 $\cong$ 124 : 110 $\cong$ 1.14

In 1994 - 95 revised, required ratio = 13250: 11000

$\cong$ 132: 110 $\cong$ 1.2

In 1995 - 96, budgeted required ratio = 15500: 13500 $\cong$ 155: 135

$\cong$ 10 : 9 $\cong$ 1.11

In 1993 - 94 revised, required ratio = 10500 : 9500

$\cong$ 105 : 95 $\cong$ 21 : 19 $\cong$ 1.1

141. The graphs clearly show an increasing trend.

142. Required ratio = (13500 - 7870) : (15500 - 8125) = 5630: 7375

$\cong$ 56 : 74

$\cong$ 28 : 37

Solutions for questions 143 to 150:

143. This can be 1, 5 or 6

From A, We get answer as 5.

From B, 6 is eliminated. But it could be 1 or 5.

144. Subtracting y - x = 1

Considering A, y can be 2 or 3 with x being 1 or 2. Correspondingly when (x, y) = (2, 3), z = 0 for 1st equation.

So, (x, y, z) = (1, 2, 3). B alone does not help because without A, we can have infinite solutions.

145. Since the thickness/outside diameter of the sphere is not given, the answer cannot be found.

146. n is always even, being a product of two even numbers. (p + 1) and (p - 1). We have 13^2 -1 = 168. Which is the only value between 150 and 200. Hence from B alone n = 168.

147. With statement A, We can conclude that X has a score below the average of I and above the average of II.

Statement B does not talk about the average of class I and hence does not give us the solution.

148. From A alone, a and b are positive $a^4 + b^4 >$ $a^3b + b^3a$

$a^3(a - b) - b^3(a - b) > 0$

or $(a - b)^2 (a^2 + a b + b^2) > 0$

Hence this is always true when a $\neq$ b.

When a = b, this is equal to 0. Hence cannot be answered by statement A.

However, the question can be answered with statement B alone as we know a $\neq$ b.

149. From statement A, we find that all the lines intersect each other and hence we cannot state how many intersections can be there. Using statement B, we know that only two lines intersect at every point. Hence, combining both the statements, we find that the number of intersections is $^{10}C_2$

i.e., $\frac{10 \times 9}{1 \times 2} = 45$

150. With both A and B taken together, ABCD can be a rhombus or a square, it is not given that diagonals are of equal length etc. which are necessary for concluding that ABCD is a square.