DATA INTERPRETATION ANSWER KEY

Q.No	Ex 1
1	2
2	4
3	3
4	3
5	3
6	2
7	4
8	4
9	2
10	3
11	3
12	4
13	1
14	4
15	2
16	2
17	2
18	3
19	3
20	1
21	3
22	1
23	2
24	2
25	1
26	2
27	4
28	1
29	3
30	2
31	1
32	2
33	1
34	2
35	4
36	2
37	4
38	4
39	4
40	2
41	3
42	1
43	3
44	2
45	1
46	1
47	4
48	1
49	4
50	1

Q.No	Ex 2
1	3
2	4
3	2
4	1
5	2
6	4
7	3
8	4
9	2
10	3
11	3
12	2
13	3
14	3
15	1
16	3
17	4
18	4
19	4
20	3
21	3
22	3
23	2
24	4
25	2
26	1
27	1
28	1
29	3
30	2
31	1
32	2
33	2
34	2
35	1
36	3
37	3
38	4
39	3
40	4
41	4
42	4
43	2
44	2
45	3
46	4
47	2
48	4
49	1
50	4

Q.No	Ex 3
1	2
2	4
3	3
4	4
5	1
6	4
7	1
8	4
9	2
10	1
11	1
12	4
13	2
14	3
15	1
16	3
17	3
18	2
19	1
20	1
21	3
22	4
23	3
24	3
25	2
26	4
27	3
28	3
29	1
30	4
31	3
32	4
33	4
34	2
35	3
36	4
37	2
38	2
39	2
40	4
41	1
42	4
43	4
44	3
45	4
46	3
47	2
48	1
49	2
50	3

Q.No	Ex 4
1	4
2	1
3	2
4	2
5	3
6	4
7	3
8	3
9	3
10	3
11	2
12	3
13	2
14	4
15	4
16	3
17	4
18	3
19	2
20	3
21	4
22	2
23	4
24	2
25	1
26	3
27	2
28	4
29	3
30	3
31	2
32	4
33	2
34	1
35	1
36	3
37	1
38	3
39	4
40	3

Q.No	Ex 5
1	4
2	4
3	4
4	4
5	1
6	2
7	2
8	2
9	2
10	3
11	4
12	1
13	2
14	1
15	2
16	4
17	2
18	3
19	4
20	1
21	4
22	1
23	3
24	3
25	2
26	2
27	3
28	3
29	2
30	4
31	2
32	4
33	1
34	3
35	4

Q.No	Ex 6
1	1
2	3
3	2
4	2
5	2
6	1
7	3
8	4
9	1
10	1
11	3
12	2
13	2
14	3
15	3
16	4
17	1
18	1
19	4
20	3
21	3
22	4
23	3
24	3
25	3
26	2
27	1
28	4
29	2
30	1
31	3
32	3
33	3
34	3

Q.No	Ex 3
51	1
52	2
53	3
54	1
55	4

EXPLANATIONS

EXERCISE 1

Direction for Qs. 1 to 2 : Refer to the following data for the following solutions.

9	3	1		
A	B	(2) C		
(6)	(5)	(7) D	8	
		(4) E	4	(8) F 7 (1) G 2
				(3) H 5
				(9) I 6

$\therefore$ E represents 4 and D represents 7 or 8.

1. (2)

2. (4)

Directions for Qs. 3 to 7: Refer to the following data for the following solutions.

Let 'x' people have high school education.

$\therefore$ 3x have middle school education and 7x have primary school education.

Also as all and middle school educational people have primary school education and all high school educated people have middle school education, number of people in Category I = 4x, Category II = 2x, Category III = x.

$\therefore$ Number of people Category I and II, who do not play any game = x and x/2 respectively.

$\therefore$ Number of people playing only hockey = Number of people playing only football.

$= \frac{3x-2}{2}$ *and* $\frac{\frac{3x}{2}-2}{2} = \frac{3x-4}{4}$ respectively

Also number of people in category III playing only hockey = $\frac{x-6}{2} = 5 = \Rightarrow x = 16$.

3. (3) 3x = 48 people have middle school education.

4. (3) Number of high school education who do not play football = $5 + \frac{x-6}{2} = 10$.

5. (3) Number of people having middle school education but not high school education who play only football = $\frac{x-6}{2} = 11$.

6. (2) Number of such people = Number of people having primary school education - No. of people having middle school education = 7x – 3x = 4x = 64.

7. (4) Number of educated people playing football only = 39.
Number of educated people playing hockey only = 39.
$\therefore$ Number of an uneducated people playing football = 90 – (39 + 5) = 46 and number of uneducated people playing hockey
= 60 – (39 + 5) = 16. Out of these 2 play both games.
$\therefore$ No. of uneducated people playing at least one game = 46 + 16 - 2 = 60.
No. of uneducated people = 200 – 7x = 200 – 112 = 88.
$\therefore$ 88 – 60 = 28 uneducated people do not play any game.

8. (4) Right turns: Actual letter – 2, 2 left turns : Actual letter + 2
A (inner) : 8; P (outer) : R ; P (inner): N; L (outer) : N; E (inner) : C
$\therefore$ APPLE would be coded as 8RNNC.

9. (2) Total alphabets + number on a wheel = 26 + 10 = 36 per wheel
Total combinations = (36 x 36) – 1 = 1295 (one is where all wheels are aligned)

10. (3) 4 combinations possible :
Inner L, Outer L, Inner R, Outer R, Inner L, Outer R and Inner R, Outer L.
Translate HOCJ9 back in each of the four above, and the only one which would reproduce an English an English word (INDIA) is inner R, outer L.

11. (3) From the given options, only (3) i.e. BEF are logically related.

12. (4) Statements BAE are logically related. Hence this is the answer.

13. (1) By combining Statements B and D, we can deduce the statements E. Hence BDE are logically related.

14. (4)

15. (2) It is given that, Blunders committed by Idiots (I) = 2 (Dumbos) ……(i)
Blunders committed by Fools (F) = 3 (Idiots) and ……. (ii)
Blunders committed by Morons (M) = 4 (Fools) …… (iii)
As, Fools commit 1200 blunders, hence Moron commit 4800 blunders, Idiots, commit 400 blunders & Dumbos commit 200 blunders from (i) , (ii) & (iii).
Hence total numbers of blunders committed = 1200 + 4800 + 400 + 200 = 6600.

16. (2) The population in each group = $\frac{400}{4}$ = 100
Let us assume that if Dumbos commit the lest number of blunders i.e. 1, hence blunders committed by Dumbos group = 1 x 100 = 100.
Note: Others may & may not commit blunders. Hence (2).

17. (2) As the population is same in each groups, hence Dumbo's population = $\frac{400}{4}$ = 100.
As every Dumbo commits the same number of blunders as every other Dumbo, so total blunders committed by Dumbos = 3 x 100 = 300.
Now using equations as shown in Q. 135,
Blunders committed by Idiots, Fools & Morons are respectively 600, 1800 and 7200.
$\therefore$ Total number of blunders of the day = 300 + 600 + 1800 + 7200 = 9900.

Direction for Qs. 18 to 20: *Refer to the following data for the following solutions.*
Equation
Salary = $n^2 + 2$ where $n \geq 1$ …….. (1)
Expenses = $2n + 1$ where $n \geq 1$ …….. (2)
Saving = $n^2 - 2n + 1$ where $n \geq 1$ …….. (3)

18. (3) Putting the value of savings in equation (3), $100 = n^2 - 2n + 1 \Rightarrow n^2 - 2n - 99 = 0$, we get n = 11.
Hence the savings would exceed Rs. 100 on 12^{th} day.

19. (3) Putting the value of n in eq.^{n} (1)
Salary = $n^2 + 2$
When n = 6000
Salary = Rs. 36000002
When n = 6001
Salary = Rs. 36012003
$\therefore$ Increase in salary = 36012003 – 36000002 = Rs. 12001. Thus he will have to remain in his job for minimum 6001 days to break the record.

20. (1) Putting different values of n starting from 1 in eq^n 3 and adding all the savings up to 11^{th} day,
Total saving = Rs. 385, so on 11^{th} day they will buy a first fixed deposit.

Direction for Qs. 21 to 25 : *Refer to the following table for the following solutions*.

	MAYFLOWER	LITTLEFLOWER
CUTTING	20 mins	30 mins
STITCHING	60 mins	60 mins
STITCHING BUTTON	15 mins	30 mins
AND BUTTON HOLES		

The time given in the table is for per uniform to be stitched.

21. (3) No. of working hours for each person = 10 hour
$\therefore$ Total time available for cutters in a day = 20 hours = 1200 mins.
Max. No. of uniform that 2 cutters can cut for Little Flower in a day = 1200/30 = 40
Time required for stitching 40 uniform = 40 x 60 = 2400 min and Alord has 5 tailors for stitching that means the Total available time is (5 X 10 x 60) = 3000 mins.
Hence maximum number of Little Flower uniforms can be completed in a day = 40.

22. (1) To complete 20 Little Flower uniforms,
Time consumed by Cutters = 20 x 30 = 600 mins
Time consumed by Tailors = 20 x 60 = 1200 mins
Time consumed by Assistants = 20 x 30 = 600 mins
Time available for Cutters = (1200 – 600) = 600 mins
Time available for Tailors = (3000 – 1200) = 1800 mins
Time available for Assistant = (1200 – 600) = 600 mins
Max. No. of uniform that 2 cutters can cut for May Flowers uniform in a day = 600/20 = 30
Time required to stitch 30 uniforms = (30 x 60) = 1800 min and is exactly equal to the time available for tailors. Hence No. of Mayflower uniform that can be completed on that day is 30.

23. (2) (1) To complete 30 Little Flower uniforms,
Time consumed by Cutters = (30 x 30) = 900 mins
Time consumed by tailors = (30 x 60) = 1800 mins
Time consumed by assistants = (30 x 30) = 900 mins
Time available for cutters = (1200 – 900) = 300 mins
Time available for tailors = (3000 – 1800) = 1200 mins
Time available for Assistant = (1200 – 900) = 300 mins
As they are not working in this available time it is the idle time.
Hence total man hours that are idle = (300 + 1200 + 300) = 1800 mins = 30 hours.

24. (2) Hiring one more assistance increases the time available for stitching buttons and button holes.
Max. No. of uniform those cutter can cut for Mayflower in a day = 1200/20 = 60
Time required by Tailors to stitch 60 uniforms = (60 x 60) = 3600 mins, whereas time available is 3000 mins only.
Hence maximum No. of uniform that can be stitched in a day = 3000/60 = 50
Time consumed by assistant to stitch buttons to 50 uniform = (50 x 50) = 750 mins
Time available for assistant = (3 x 10 x 60) = 1800 mins.
Hence 50 uniforms can be completed in a day.

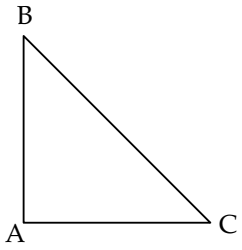
25. (1) Max. number of uniforms that can be cut by those 2 cutters in a day for MayFlower is 60. And the buttons and buttonholes can be easily stitched by the 2 assistant for these 60 uniforms in a day in the time available for them. While 5 tailors can stitch only 50 uniforms in the available time. Hence, A lord will hire 1 tailor to get maximum increase in production capacity in a day.

26. (2) From statement A alone
$4n + 48 = 10^2$
$4n = 52$
$n = 13$
A alone is sufficient.
From statement B alone:
Numbers whose squares lie between 150 and 250 are 13, 14 and 15
Among these A, only 13 is a prime number.
∴ B alone is sufficient.

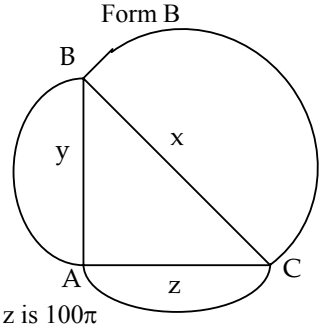
27. (4) Even upon using both the statements we can only conclude that two of the opposite sides are parallel and sum of 2 angles is 180°.
In order to conclude that ABCD is a rectangle which is also a cyclic quadrilateral we also need to know whether the opposite sides are equal in length.

28. (1) From A
$(n - 3)(n - 2) = 0$
$n = 2$ or 3
∴ A alone is not sufficient
From B
Only for n = 2
$\frac{n!}{2} = (n-2)!$ i.e. $\frac{2!}{2} = (2-2)!$
$1 = 0! = 1$
B alone is sufficient.

29. (3) From A



Form B



Given, sum of areas of semi-circles x, y and z is 100π
If BC = a cm, AC = b cm, AB = c cm.
Area of semi-circle x is $\pi/2\ a^2/4\ cm^2$
Area of semi circle y is $\pi/2\ c^2/4\ cm^2$
Area of semi circlezx is $\pi/2\ b^2/4\ cm^2$
$½\ \pi/4\ (a^2 + b^2 + c^2) = 100\pi$
$a^2 + b^2 + c^2 = 400$
We know that in ΔABC
$a^2 = b^2 + c^2 = \therefore 2\ (b^2 + c^2) = 800$
$b^2 + c^2 = 400$
$b^2 + c^2 = a^2 = 400 \Rightarrow a = 20$
$\Rightarrow$ b or c = $10\sqrt{3}$ and $\Rightarrow$ the sides are 10, $10\sqrt{3}$, 20
$\therefore$ the perimeter = $30 + 10\sqrt{3}$ cm

30. (2) From A
profit % is 35% (i.e. 10 +25)$\Rightarrow$ profit = Rs.35
From B Mankup% = 80%
$\Rightarrow$ profit % = 1/5 x 80 = 16%

profit = Rs.16
∴ Either statement is sufficient

31.(1) From A alone.
Tram A takes 30 seconds to cross tram B if it were stationary. Either the trains were moving in the same directions where the speed of train A is greater than the speed of the tram *B* or the trains are moving in the opposite direction.
If they the trains were moving in the opposite direction, A would have taken less than 30 seconds to cross B.

Therefore the trains are moving in same direction and the speed of the train B $= 90 - \left(\frac{750}{32} \times \frac{18}{5}\right)$

B alone is not sufficient.

32.(2) From statement A
only 11 is the two digit prime which satisfies the condition.
i.e. $11^2 = 121$
$11^3 = 1331$
From statement B
only 9 is such number
when $9^2 = 81$ and $8 + 1 = 9$
$9^3 = 729$ and $7 + 2 + 9 = 18$

33. (1) From A

n can take negative values for which $\frac{10^n + 5}{3}$

is not an integer and for positive values of n, $10^n + 5$ will result in a number which has the sum of its digits equal to 6 which is a multiple of 3,

$\therefore \frac{10^n + 5}{3}$ is an integer if n is positive

From A, n can be negative or positive

From B, n can be only positive and hence $\frac{10^n + 5}{3}$ is an integer.

34. (2) From statement A alone,
A worked for 14 ½ days and B worked for 14 days, so they together will be able to finish the work in less than 14½ .
So A alone is sufficient.
From statement B alone,
When the slower person starts the work, the work takes 29 days. So, when the faster person starts the work, the work would be completed in less than 29days.
So, they together need less than 29/2 days to complete the work.
So B alone is sufficient.

35. (4) From statement A alone, two cases are possible
Case 1
The two trains are travelling in the same direction. In this case, the speed of train B must be more than that of train A.
Case 2
The two trains are travelling in the opposite direction In this case, if speed of train B = 60 km/hr time taken to cross each other

$$= \frac{750}{(60+60)\times\frac{5}{18}} = 22.58$$

$\therefore$ Speed of train B must be greater than 60 km/hr i.e. greater than speed of train A.
Since both the cases are possible, nothing can be concluded.
even after using statement B, both cases remain.

36.(2) Number of Maruthi cars sold in 1 994 = 40% =1000,000 Number of Fiat cars sold in 1994 » 20% = 500,000

37.(4) Fiat in1995 $\rightarrow 1125\left(\frac{30}{40}\times 1500\right)$

Fiat in 1996 $\rightarrow$ $818\left(\frac{15}{55}\times 3000\right)$

Fiat in 1997 $\rightarrow$ $1167\left(\frac{35}{45}\times 1500\right)$

Ambassador in 1997 $\rightarrow$ 334
Ambassador in 1998 $\rightarrow$ 423
On observation we can see that all the statements are true.

38.(4) Choice A is false
Number of cars sold by Fiat in 1994 (in thousands)

$$\frac{20}{100}\times\frac{100}{40}\times 1000$$

Number of cars sold by Fiat in 1 996 (in thousands)

$$\frac{5}{100}\times\frac{100}{70}\times 2000 = \frac{100}{7}$$

$\therefore$ % decrease is close to 71 % Choice (2) is false
Although percentage share is same for the two years,
the total production is different. Choice (3) is false.
The increase in total production is from 1500 to 3000, which is exactly 100%

39.(4) Ford Escort in 1995 $\rightarrow$ 750
Ford Escort in 1996 $\rightarrow$ 272.7
Ford Escort in 1997 $\rightarrow$ 333.3
Ford Escort in 1998 $\rightarrow$ 285.7

40.(2) Total number of cars sold in
1995 $\rightarrow$ 1500 x 100/40
1996 $\rightarrow$ 3000 x 100/55 $\rightarrow$ Maximum
1997 $\rightarrow$ 1500 x 100/45
1998 $\rightarrow$ 2000 x 100/70

Solutions for questions 41 to 45:
Originally money realised by sales = 10 x 50000 = 5,00,000
Money realised from (3)
= 5.00,000 - 0.5 x 0.4 x 5,00,000 = 4,00,000
Money realised from (2)
= 5,00.000 [0.1 x 0.5 + 0.2 x 0.5 + 0.1 x 0.4] - 2,00,000 + 5,00,000 = 3,95,000 Money realised from (1)

= 0.5 x 50000 [1 + 0.5 x 0.3 + 0.5 x 0.2] = 3,12,500

41. (3) Hence the most profitable option would be to remain silent.

42. (1)

43. (3) Loss = 5,00,000-3,12,500= 1,87.500.

44. (2) As calculated above, it is Rs.3.95,000

45. (1) Net revenue from course 2 = 3.95 lakhs

Net revenue from course 3 = 4.00 lakhs

∴Rs.5000 less

For answer to questions 46 to 50:

Production	**Total cost= Fixed cost+ Variable cost**		
	Plan 1	**Plan 2**	**Plan 3**
1000	2	3	4
2000	3	3.5	4.5
3000	4	4	5
4000	5	5	5.5
5000	5.5	6.5	6
6000	6.5	7.5	6

Now all the questions can be answered.

46. (1) **47.** (4) **48.** (1) **49.** (4) **50.** (1)

EXERCISE 2

Direction for Qs. 1 to 5: Refer to the following information the following solutions.
From clues I & III we can conclude that B is always present and one only one of A & C is always present. Also note that when D goes than the only combination possible agents is D-E-G and from clues IV, in such a case A should be included.

1. (3)
2. (4)
3. (2) From clues IV & VI we conclude that F – G – H are the recruitment agents that should be included. Hence only one combination is possible.
4. (1)
5. (2) From previous solutions we know that F, G and B all can go with C,

Directions for Qs. 6 to10 : Refer to the following table for the following solutions.
The following table gives the moves that can be made for the mentioned conditions. The underlined positions indicate your position after n^{th} move.

Move	Minimum Score	Maximum Score	Reaching 5 O'clock
0^{th}	$\underline{1} = 1$	$\underline{1} = 1$	$\underline{1}$
1^{st}	$\underline{7} – 4 = 3$	$\underline{12} – 2 = 10$	$\underline{12}$
2^{nd}	$\underline{1} – 4 = 3$	$\underline{11} – 2 = 9$	$\underline{11}$ / $\underline{6}$
3^{rd}	$\underline{2} = 2$	-	5
4^{th}	-	-	-
Total	3	20	-

6. (4)
7. (3)
8. (4) By moving a step anticlockwise in the first move, you reach at 12 O'clock. From here you can reach
(1) 10'O Clock through $\underline{12} – \underline{11}$ - 10
(2) 5 'O clock through $\underline{12} – \underline{6} – \underline{5}$
(3) 7 'O Clock through $\underline{12} – \underline{6} – 7$.
But you cannot reach 6 'O Clock.

9. (2)
10. (3) Your mother's husband ⇒ your father. Your father's sister ⇒ your aunt. So, the lady's aunt is the man's aunt ⇒ the man and the lady are brother and sister.

11.(3) M is the maternal uncle of R means m is the brother of R's mother (say K) i.e., M + K – R.

Direction for Qs. 12 to 13 : *Refer to the following information for the following solutions.*
We are given that A visited at 8 O'clock. Now from III we conclude that A visited at 8 p.m. Now from I we concluded that B has to visit at 9 a.m. otherwise nobody will be able to visit in between A & B. Now if D were to visit at 11 p.m. then condition IV will get violated hence we concluded that D visited at 11 a.m. and C visited at 10 p.m. From here all the questions are answered.

12. (2)
13. (3)
14. (3) As $X^2Y^3 = 8$, either X or Y or both are fractional. From statement B, we get that X is rational.

Therefore, X2 is either and integer or a fraction. Therefore, $X^2 = \frac{8}{\gamma^3}$ will either be an integer or a fraction, So either X or Y is a fraction.

15. (1) Statement A alone is sufficient to say that B is not prime. However, statement B alone is not sufficient.

16. (3) From statement A we can conclude that 3x is even. As y is an integer (by virtue of it being odd) from statement B, we can conclude that 10y is even. The sum of two even numbers will be even.

17. (4) From statement A we cannot conclusively state which of the three is largest as they could all be positive or negative. From statement B we know that xyz is positive as $xyz - y^2$ (as y^2 will always be positive for real values of y) is positive. This is possible in two cases, I. All of x, y and z are positive in this case z is the greatest II. Y is negative and one of x and z is negative. Hence we cannot conclude even if we combine the two statements.

18. (4) From both the statements we know the ratio of the speeds and the times at which they met. Without knowing the distance between the two cities X and Y, we will not be able to find out the speed of L or M.

19. (4) Those S which are M are not P. Hence some S are not P.

20. (3)

21. (3) Those 'M' are not 'P' are 'S' because all 'M' are 'S'

22. (3) Important link here is 'could'.

23. (2)

24. (4) Because the minority might consist of thousand of people, the opposition might not be inconsistent with the speaker's remarks.

25. (2)

26. (1) Since the number of persons per household can be assumed to be a constant, the ratio of x1 to x2 is the same as the ratio of the number of property crimes per1000 households in 1975 to that in 2000. This value is $\frac{560}{180} = 3:1$.

27. (1) Let the number of households in thousands be T1 in 2000 and T2 in 2050. The total number of property crimes in 2000 is, therefore, T1 × 180. This will reduce to T1 × 180 × 0.71 × 0.71. The number of property crimes per thousands households in 2050 is, therefore, T1 × 180 × 0.71 × 0.71/T2/ Since the number of persons per households remains constant, the ratio of T1/ T2 is the same as the ratio of the populations. The ratio of the populations is (157+ 2.3 × 50)/ (157 +2.3 × 100). The required answer comes out to be approximately 63.

28. (1) Let x be the number of aggravated assaults per thousand population. The number of robberies is x – 1.8 and the number of simple assaults is 3x. From the graph, we get the sum of all the three as 27. Hence x – 1.8 + x+{ 3x = 27, giving x = 5.76 and x – 1.8 = 3.96. The total number of robberies is, therefore, (3.96/1000) × (1.57 + 2.3 × 50) ×10^6 = 1.1 × 10^6.

29. (3)

30. (2) The number of property crimes in 2000 was 180 × H where H is the number of households in the thousands in 2000.

The number of violent crimes in 1975 was 49 × P1 where P1 is the population in 1975 in thousands. Therefore, $180 \times \frac{H}{49 \times P1} = 1.45$ which gives $\frac{P1}{H} = \frac{3.67}{1.45}$

The quantity required is $\frac{P2}{H}$ where P2 is the population in 2000.

But P2/ P1= $\frac{157 + 2.3 \times 50}{157 + 2.3 \times 25} = \frac{272}{214.5}$. Therefore P2/ H= $\frac{272}{214.5} \times \frac{3.67}{1.45} \approx 3.2$.

31. (1) Week 1, for detailed solution refer the table below.
32. (2) 50, for detailed solution refer the table below.
33. (2) 200 units' week 3, for detailed solution refer the table below.
The gross requirement of leg is 200 and 600 in week 3 out of 300 in – hand units of legs, 200 units would be used for wek2 requirement and the rest units would be used for meeting the requirements of week 3. Therefore net requirement of week would be 600 – 100 = 500 units of legs for meeting the demand of finished table of week 5.

34. (2) For meeting the additional demand of 200 tables
Shortrails = 4 ×200 = 800
Legs = 8 × 200 = 1600
Total shortrails = 300 + 800 = 1100
Total legs = 600 + 1600= 2200.

35. (1) Details of components available on a particular week.
Figure in bracket represent the week to which components belong.

Details	**Week1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**
Table	50	50+50	100	200	150	
Leg assembly	100	100 – 50 = 50(4)	100(4)	150(6)	100(6)	
Legs	150	150 + 50=200(6)	600(5)	400(6)		
Shortrails	50	50 + 50 = 100(4)	300(5)	200(6)		
Longrails	0	100 (4)	300(5)	200(6)		
Top	50	50 – 50 = 0	100(4)	150(5)	100(6)	

Details of component ordered on a particular week.

Details	**Week1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**
Table						
Leg assembly						
Legs	50(4)	600(5)	400(6)			
Shortrails	50(4)	300(5)	200(6)			
Longrails	100(4)	300(5)	200(6)			
Top	100(4)	150(5)	100(4)			

Week 1
As lead – time increased by 1 week so planned order release would be by one week ahead.

36. (3) I. $\frac{a}{3} < \frac{b}{4} \quad \frac{b}{2} < \frac{c}{3}$

$\Rightarrow 4a < 3b \qquad \Rightarrow 3b < 2c$

$\Rightarrow a < b \qquad \Rightarrow b < c$

(as both a & b are positive) ($\therefore$ b & c are positive)

But, this is not sufficient as nothing is known about d till now

II. $\frac{a}{4} < \frac{d}{6} \quad \frac{c}{4} < \frac{d}{3}$

$\Rightarrow 6a < 4d \Rightarrow 3c < 4d$

$\Rightarrow a < d$

This means a < d, but nothing can be concluded about the value of d compared to b or c.

When we combine I & II,

We get 3b < 2c or 9b < 6c & 3c < 4d or 6c < 8d

Which can be represented as $9b < 6c < 8d \Rightarrow 9b < 8d \Rightarrow b < d$

We know that b < c & a < b. this shows that a is smallest and b the second smallest number, even thought which is greater between c & d cannot be decided.

37. (3) LCM & HCF of A & B are 72& 12 respectively.

$\therefore$ LCM × HCF = A × B $\Rightarrow$ 72 × 12 = A × B

Values (A, B) can take so that HCF will be 12 & LCM 72 are (12, 72) and (24, 36)

I. A is not a factor of B, which means A and B can take either 123 and 72 or24 and 36 as together values but not necessarily in the same order i.e.,

A = 72 and B = 12 OR

A = 36 and B = 24 OR

A = 24 and B = 36

II. B is greater than A. This means B can be either 72or 36.

Hence II alone is not sufficient. Combining, I & II, we get A = 24 & B = 36. Hence, the answer is (3).

38. (4) I. Let R & S be the ages of Ram & Shyam respectively.

Age of Ram 5 years back = R – 5 & Shyam = S - 5

$\therefore$(R - 5) + (S – 5) = 60 or R + S = 70 …(1)

Hence, I alone is not sufficient.

II. Ages of Ram & Shyam fifteen years hence will be R + 15 & S + 15

$\therefore$(R + 15) + (S + 15) = 100

$\therefore$ R + S = 70 …..(2)

Hence, II alone is not sufficient .

Combining I & II,

We are getting the same equation in both cases, hence we cannot we conclude what are the ages of Ram & shyam respectively.

39. (3) Let r & R be the radius of sphere & cone respectively.

Let h be the height of the cone.

Volume of sphere = $\frac{4}{3}\pi r^3$

Volume of cone = $\frac{1}{3}\pi R^2 h$

I. Radius of cone, R = 2r

$\therefore$Volume of sphere = $\frac{4}{3}\pi r^3$ & volume of cone = $\frac{1}{3}\pi \times 4r^2 h$

Ratio of volume of sphere to that of cone = $\frac{\frac{4}{3}\pi r^3}{\frac{1}{3}\pi \times 4r^2 h} = \frac{r}{h}$. Hence, I is not sufficient.

II. Height of the cone, h = r.
But, this alone cannot give us the ratio. Hence, II is also not sufficient.
Combining I & II

$$\text{Ratio} = \frac{r}{h} = 1 \ (\therefore r = h)$$

40. (4) I. D is the tallest among C, D & E. But, we don't know anything about A & B. Hence, I is not sufficient.

II. B is not shorter than D, means B is either taller than or equal to D, But, this is not sufficient, as nothing is known about C & E. Combining I & II,

We get that D is the tallest of C, D & E. And B not shorter of A & B. Between B & D it is opt known whether they are equal or B is taller, which means either B is the tallest in the group or A; B & D both are the tallest in the group hence we cannot decide.

41. (4) It y is dropped, XZ must be selected. Since Z is there, N cannot be taken hence M and P must be taken.

42. (4) It L is taken, we cannot take Y hence XZ must be taken and also P.

43. (2) If Y and Z are taken, L and N cannot be taken hence M and P must be taken

44. (2) Visually, we see US has reported more than 21,000 cases.

45. (3) Bahamas, Belgium, Denmark

46. (4) West Germany = 222, France 555 Reqd ratio = 222 : 555 = 2 : 5

47. (2) Bahamas, Burundi, French Guyana and US.

48. (4) 4% of x = 286,000 hence x = 715,000.

49. (1) Only I and II are true.

50. (4) Ethiopia, Israel and Yugoslavia.

EXERCISE 3

1. (2) Using I above since ABC is a right angled triangle and the largest angle = 90⇒ I alone is sufficient.
Using II above since $3^2 + 4^2 = 5^2$ ABC is a right angled triangle and the largest angle = 90". => II alone is sufficient.

2. (4) Since the actual number of institutes in Hyderabad is not mentioned, even both the statements are insufficient.

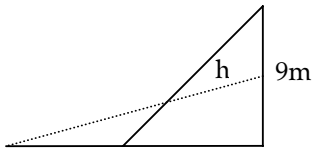
3. (3) From I $8- (a-b)^3>0$
$\Rightarrow 8 > (a - b)^3$
$\Rightarrow (a-b)^3 < 8 \Rightarrow a-b < 2$ - (1)
Nothing can be said about this.
From II $4- (a-b)^2 < 0$
$\Rightarrow 4 < (a - b)^2$
$\Rightarrow (a-b)^2 > 4$
$\Rightarrow | (a - b)| > 2$
$\Rightarrow$ a - b > 2 or $\Rightarrow$ a-b<-2- (2)
$\Rightarrow$ From equation (1) and (2) we can see that $a-b < -2 \Rightarrow a < b$

4. (4) Since the weights of the balls mentioned are not given, ft is not possible to determine the heavier box.

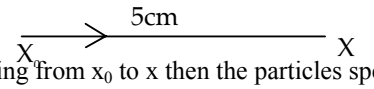
5. (1) B alone is sufficient because the statement implies b = 0
$\therefore$ a/b is not defined.

6. (4) Since the angle given is 80' in (I) and the time between 3' clock and 4" clock in (II), we can see that there can be two values, hence no unique answer possible.

7. (1) From (I) the dotted line is the ladder at say 8:30 A.M. since we want the height h of the ladder (i.e the point from where ladder touches the wall to the point the ladder touches the floor) and since the length of the ladder is given in statement (I). Answer can be got from (I) alone. Statement (II) will not give the length of the ladder.

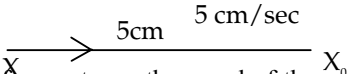


8. (4) From statement I, we cannot find the speed at x.
Similarly from statement II also, nothing is given about point x. But from I and II, two possibilities arise, i.e. one case



if the particle is moving from x_0 to x then the particles speed at x would be 7.5 cm/s

second case



If the particle is going from x to x_0, the speed of the particle at x would be 2.5 cm/sec, Since no unique answer can be found.

9. (2) As per statement alone if q = 100 then p = 150
$\therefore$ p/q = 150/100 = 3/2 As per Statement II alone if r = 100
then p =187.5 and q= 125
so, p/q = 187.5/125

$\therefore$ the question can be answered statement I alone or statement II alone.

10. (1) As per statement II alone, a sum of Rs.8 can be arrived at by adding 2 and 3 in the form 2 + 3x2 = 8 i.e. one pencil and two pens

11. (1) Three tablets/day would mean the hypertensive has to be taken 90 times in 30 days
The increase 2.50……> 10 tablets
hence for 2.50 x 9 = 22.50 for 90 tablets Asthmatic has to consume…> 30 tablets 6.00x3= 18.00
$\therefore$ The total increase = 22.50 +18 = 40.50

12. (4) $\frac{1.00}{1.50} \times 100 = \frac{2}{3} \times 100 = 66\frac{2}{3}\%$

13. (2) He has to consume = 2 x 3 x 7 x 20 = 840
spoons 90 spoons …….. 1 bottle
840 spoons …… 10 bottles
since he cannot buy $9\frac{1}{3}$ bottles;
hence expenditure according to the existing prices
= 10x18.00 = Rs. 180

14. (3) Since he may change the order in which he takes the tablets it is not possible to determine

15. (1) To arrive at the correct value of the total sales of Fuels the inter company sales figures should be subtracted from the present total sales. To be subtracted from 100%
PRL $\Rightarrow$ 50 + 10 + 40 = 100% i.e. has sold all its sales to other companies only $\Rightarrow$ correct sales = 0%
OICL$\Rightarrow$ 15 + 20 + 10 = 45
$\Rightarrow$ (100 - 45)% of 30% = 16.5%
PHCL $\Rightarrow$ 20 + 20 + 20 = 60
$\Rightarrow$ (100 - 60)% of 25% = 10%
PBCL $\Rightarrow$ 30 + 10 + 35 = 75
$\Rightarrow$ (100 - 75)% of 20% = 5%
OTHERS $\Rightarrow$ 10 + 5 + 10 = 25
$\Rightarrow$ (100 - 25)% of 15% = 11.25%
$\therefore$ Actual sales:
= (0 + 16.5 + 10 + 5 + 11.25) = 42.75% of given sales
$\therefore$ % by which total sales of fuels were over estimated
$\frac{(100 - 42.75)}{42.5} \times 100 \cong 135\%$

16. (3) The correct sales figures
= (100 - % sales to other companies) x % share of total sales given = (100-M) x p (say)
$\therefore$ M should be minimum and p maximum. By observation this is true for OICL in case of Fuels and for PBCL for lubes.
(Note that OTHERS and PRL are eliminated) Calculations between PBCL and OICL
OICL:
= (100 - 45) x 30% x 25 + (100 - 60) x 15% x S
(where S = sales of lubes and since sales of fuels
= 25)
$\cong$ .45

For PBCL
= (100 - 75) x 20% x 25 + (100 - 45) % x 30% x S
≅ 0.275 S
∴ Clearly it is maximum for OICL

17. (3) We need to find that company for which Total sales are less than total purchases = S-P is minimum (and -ve) i.e. S is minimum and P is maximum S is from the pie chart and P is the sum of purchases obtained from the columns in the table. By observation alone
OTHERS have purchased far more than any of the rest.
And its sales are also minimal for both lubes and fuels.

18. (2) For maximum Profitability. Sales - Purchases should be maximum.
∴ S - P must be maximum
For ICL, the total Purchases are 17.5% and
∴ Profitability = 30 - 17.5 = 12.5% [i.e. 50% of PRL + 20% of PHCL + 30% of PBCL + 10% of OTHERS]
Similarly, for PHCL Profitability = 25 - 8.25 = 16.75 for PBCL Profitability = 20 - 12.5 = 8/5% and for others, there is Negative Profitability as we have seen in 2127.

19. (1) The correct sates figures for Fuels have already been calculated in solution (1) and in similar manner we calculate those of lubes
OTHERS ⇒ [100 - (15+5+15)] x 25% = 16.25%
PHCL ⇒ [100 - (10+25+40)] x 20% = 5%
OICL ⇒ [100-(20+40)] x 15% = 6%
PBCL ⇒ [100 - (15+5+25)] x 30% = 16.5%
Now total sales of lubes =% x that of fuels ⇒ effect values for above are OTHERS ⇒ 8.125
PHCL ⇒ 2.5% (of total sales of fuels)
OICL ⇒ 3%
PBCL ⇒ 8.25%
The total correct sales value of fuels and lubes put together maximum is for OTHERS ⇒ 11.25 + 8.125 =19.375
PBCL⇒ 5+ 8.25 =13.25%
OICL ⇒ 16.5 + 3 = 19.5%
PHCL⇒ 10 + 2.5 = 12.5%
∴ OTHERS is second in terms of (correct) total value of sales of fuels and lubes put together.

20. (1) Let the amount of paddy to be processed = q kg. the amount of rice it yields = q x 0.95 = 0.95 q out of this if you exclude 6% broken

$$0.95q\left(1-\frac{6}{100}\right) = 0.893q$$

∴ So the rice you get = 0.893q ∴ 0.893q x 8 = 14.288
0.893q = 1786 q = 2000 kg.

21. (3) The rice produced by processing 10.000 kg of paddy = 9,500 kg.
if the brokens increase by 2% of 9,500 ⇒ 190 kg
of additional brokens 190 kg of fine nee less ⇒190 x 8 = 1520 but this is offset by 190 x 2 = 380 profit over sale of additional brokens 1, 520 – 380 = Rs.1, 140

22. (4) 5% loss of weight would imply = 0.05 x 10,000 = 500kg.
the rice extracted will be = 9,500 x $\frac{95}{100}$ = 9025
the decrease will be = 9, 500 - 9025 = 475 kg.

23. (3) Proceedings from sale of husk =

$5000 \times 0.05 \times \frac{1}{2} = Rs.125$

proceedings from the sale of brokens =

$5000 \times 0.95 \times \frac{6}{100} \times 2 = 570$

hence amount realised = Rs.570 + Rs 125 = Rs.695

Solutions for questions 24 to 27:

'It-is given that the cages are as follows.

			Antelope		Gorilla	
Elephant	Gorilla	Giraffe	Antelope		Deer	
1	2	3	4		5	
Chimpanzee		Horse	Zebra	Bear	Tiger	Lion
6		7	8	9	10	11
Wolf						
12						

From statement (1) we get elephant is in 1st cage, wolf is in 12th cage and chimpanzee is in 6th cage.
From statement (3) we get lion is in 11th cage, deer is in 5th cage and tiger is in 10th cage.
From statement (4) we get horse is in 7th cage
From statement (2) we get bear is in 9th cage, and zebra is in 8th cage and giraffe is in 3rd cage.
Either Antelope or Gorilla is in the 2nd cage or 4th cage.

24. (3) If tiger is not opposite to Gorilla, then the order of the animals are as follows.

Elephant	Gorilla	Giraffe	Antelope	Deer
Chimpanzee	Horse	Zebra	Bear	Tiger
Lion	Wolf			

Then Gorilla is adjacent to Elephant.

25. (2) The animals can be arranged in two ways.

26. (4) Either Gorilla or Antelope is in between Giraffe and deer.

27. (3) If elephant is shifted to the 12tH cage and deer is adjacent to gorilla, then the order in which the animals are arranged in the cages is

Wolf	Lion	Tiger	Bear	Zebra	Horse
Chimpanzee		Deer	Gorilla	Giraffe	Elephant

Gorilla is opposite to tiger.

28. (3)

1	2	3	4	5
C	E	A	D	B

C, E, A are in that order as C's number is less than E's as E's is less than A's. Hence C, D and A can only take box numbers 1, 2 and 3. Therefore B has to be in box number 5.

29. (1) (38 - 30)/30 = 26%
30. (4) Visually, we see D is more in 1995 while total is more or less constant
31. (3)
32. (4) 55 - 34 = 21lakh.
33. (4) 28/176 = 16%.

Solutions for questions 34 to 38:

It is given that the number of games played by each player is different, i.e. one player plays one game, another plays two games and so on. With the given information we can conclude that

	Chess	Swimming	Weightlifting	Cycling	Tennis
Pranay	×		√		√
Qureshi	√		√		√
Rasool	×		√	√	
Surendar	×		√		
Tarif	×		×	√	√

From (6) Tarif does not plays weightlifting because cycling is the only common of Rasool and Tarif.
3 players participates in swimming and the most common game is weightlifting. Hence 4 players participates in weightlifting,
From (6), Rasool does not play Tennis
All the players play at least two games except Surender. From Statement (1) we get Surender plays only one game and
Qureshi plays all the five games and Pranay do not play cycling,
From (3) Tarif do not play swimming.
Hence, the final arrangement is as follows.

	Chess	Swimming	Weightlifting	Cycling	Tennis
Pranay	×	√	√	×	√
Qureshi	√	√	√	√	√
Rasool	√	√	√	√	×
Surendar	×	×	√	×	×
Tarif	×	×	×	√	√

34. (2) Qureshi plays all the five games.

35. (3) The common game among Pranay, Qureshi and Rasool are swimming and weight lifting. Hence (1) is not true.
The common game among Qureshi and Tarif is cycling and tennis. Hence (2) is not true. All the four games except Tennis are played by Qureshi and Rasool is true.

36. (4) Four players participate in weight lifting.

37. (2) When the first 10, 20, (and so on) players are sent back in that order the row is gradually "and completely reversed after every 80 players who are sent back. Total number of players sent back = 10 + 20 +.... 80 = 360
i.e. (80 x 4) * 40 ^ effectively only the first 40 players have been sent to the end of the row and hence the player numbered 5 will be in the 40 + 5 = 45^{th} position.

38. (2) It is given that A wears Black shirt means A cannot wear black trouser, blue trouser, white trouser. Hence he wears either Red or Green trouser
Similarly, D wears Green shirt means he cannot wear green trouser, black trouser, white trouser. Hence he wears either Red or Black trouser. It is also given that D does not wear Black trouser. Hence D weans Red trouser and A wears Green trouser. It was also given that neither B nor E wears the Blue trouser. Hence, C wears the Blue trouser.

Solutions for questions39 to 42:

39. (2) The sector recording a decrease of 8 percentage points is medicine the sector recording a 5 percentage of points increase is education the difference in amounts allocated in 1992 will be

$$2{,}50{,}000\times\frac{15}{100}-2{,}50{,}000\times\frac{10}{100}=12{,}500$$

40. (4) The year in 4 sectors = Rural Development is 1992; the difference between maximum and minimum allocations is

$$2{,}50{,}000\left(\frac{15}{100}-\frac{10}{100}\right)$$

$$= = 2{,}50{,}000\times\frac{5}{100}=\text{Rs.}12{,}500$$

41. (1) In the year 1992 medicine + agriculture is 15% + 15% = 30%

42. (4) The maximum percentage increase is for the rural development
$\therefore$ the difference in outlay for two years 1, 25, 000 - 80, 000 = Rs.45, 000

43. (4) The states with a growth greater than 10% are Sikkim, Tripura, Assam, West Bengal.
Total production = 0.6 + 18 + 45 + 72 + 84 + 102 = 321.6
Production of states which show more than 10% increase
= 321 .6 - (0.6 + 45) = 276
276/321 = 85.8%

44. (3) The maximum % increase in 1994-95 is for the state of Tripura which is 33.33%. Where as the least percentage decrease is zero in case of Manipur
$\therefore$ x^2/y^2 is undefinable.

45. (4) The average production for 1993-94

$$\frac{0.6+16+42+54+76+90}{6}=46$$

and the state which is closest to that is Nagaland which is 42 (closest to average production) The average production of all the states for year 1995-94 =

$$\begin{array}{r} 90 \\ 76 \\ 54 \\ 42 \\ 16 \\ \underline{0.6} \\ 278.6 \end{array}$$

$$\frac{278}{6}=46.4=\text{average production}$$

The state is Nagaland with 42 (closest to average production)
$\therefore$ The production of Assam + West Bengal = 166

$$\frac{166-42}{42}\times 100=300\%$$

46. (3) The state which records 33% increase is Tripura has 19% of the lot at production for the year 1993-94.

47. (2) Total trees = 21.600
Cherries are 37.5% of total = 3/8 x 21600 - 8100
Fruit yielding cherry tree are 61% of 8100
= 3/5x8100+ 1% of 8100
= 4860 + 81 = 4941

48. (1) Apricot fruit yielding trees = 12.5% of 87% of 21600. = 10.87% of 21600
Peach fruit yielding trees = 12% of 78% of 21600 = 9.36% of 21600
$\therefore$ 10.87% of 21600- 9.36% of 21600 = 1.51% of 21600 = 327

49. (2) Avercado = 11%x93%of2l600
= 10.23% of 21600
Apricot = 12/5% of 87% of 21600
= 10.87% of 21600.
Peach = 12% of 78% of 21600 = 9.36% of 21600
Plum = 13% of 77% of 21600 = 10.01% of 21600
By observation Apricot has the greatest number of fruit yielding trees.

50. (3) **T**he percentage of fruit yielding plum trees as a percentage of fruit yielding peach trees is

$$\frac{10.01}{9.36} \times 100 = 107\%$$

51. (1) Only S_3, S_6, S_7 and S_8 have qualified and among these it is dear (by addition) that 106.5 marks is the highest for S_3.

52. (2) The four people who have qualified are 1
S_3 (106.5); S_6(105)
S_7 (103) and S_8 (96)

53. (3) Adding the total number of mistakes.
S_1 = 30 mistakes
S_2 = 27 mistakes
S_3 = 46 mistakes
S_7 = 30 mistakes

54. (1) (a) Maximum score in RC is 37.5 and was secured by S_2. yet he did not qualify. Hence statement I is true.
(b) 82 is the person with the maximum grand total and he did get the maximum in VA and RC sections arid hence statement II is false.
(c) S_6 has made maximum attempts. Not S_8. Hence statement III is false.
Hence only statement I is true.

55. (4) Maximum number of questions answered correctly by
S_8 is 110
S_7 is111
S_5 is 59
S_6 is 115

EXERCISE 4

1. (4) From Table 2, we see that in 1980, the total number of consumers ere 32571×10^3 and from Table 1, the average energy consumption per 1000consumerswas2.5 GWH. Hence the total energy consumption would be $32.6 \times 10^6 \times \frac{2.5}{1000}$ GWH $\approx 0.82 \times 10^{11}$ KWH. **Hence (4)**

2. (1) The total electricity consumed in 1994 (obtained from the number of consumers and the average energy consumption per consumer) is $0.86 \times 10^5 \times 3.5$ GWH. This is also equal to the area average consumption per sq. km.

Hence the area is equal to $0.86 \times 10^5 \frac{3.4}{\left(\frac{88}{1000}\right)} = 3.3 \times 10^6$ sq. kms. **Hence (1)**

3. (2) Let C1 and C2 be the number of consumers in 1970 and 1980 respectively, let P1 and P2 be the populations in 1970 and 1980 respectively. Then $\frac{\left(\frac{N1}{C1}\right)}{\left(\frac{N2}{C2}\right)} = \frac{3.3}{2.5}$ and $\frac{\left(\frac{N1}{P1}\right)}{\left(\frac{N2}{P2}\right)} = \frac{0.09}{0.134}$. Since f1 $= \frac{C1}{P1}$ and f2 $= \frac{C2}{P2}$, the required ratio $\frac{f2}{f1} = \frac{\left(\frac{3.3}{2.5}\right)}{\left(\frac{0.09}{0.134}\right)} \approx 1.97$. **Hence (2)**

4. (2) We use Table 2 to obtain the ratios of the number (1990 to 1980) of consumers for Domestic, Commercial, Industrial, agricultural and Total. The values are 2.26, 1.75, 1.81, 2.04, and 2.14 respectively. **Hence (2)**

5. (3) The number of Domestic consumers in 1970 and were 10165 and 63406 thousands respectively giving a percentage increase of approximately 524%. **Hence (3)**

6. (4) Both the statements individually or combined are not sufficient $6^2 = 36$ divisible by 2 & 3 or $5^2 = 25$ not divisible by two consecutive numbers. **Hence (4)**

7. (3) Since the probability of drawing a red marble is $\frac{1}{24}$ and the number of marbles < 40, $\therefore$ the number of marbles in the bag is 24, of which one is red.

From I The probability of drawing a blue marble is $\frac{1}{3}$,

$\therefore$ the number of blue marbles is 8

$\therefore$ number of black marbles 24 – (1 + 8) = 15

$\therefore$ The probability of drawing a black marbles is $\frac{15}{24} = \frac{5}{8}$.

$\therefore$ Both statements are necessary.

Alternatively,

Using both the statements, the probability of drawing a black marbles 1 - $\left(\frac{1}{24} + \frac{1}{3}\right)$

(since there are only red, blue and black marbles). **Hence (3)**

8. (3) Possible values of x can be 1, 2, 3, 6, 17, 34, 51, 102
Form I : x + 17 is divisible by 3
$\therefore$ x + 2 is also divisible by 3 which is possible when x = 1or 34
From II : x + 2 is divisible by 4 which is possible when x = 2, 6, 34
$\therefore$ Using both statements, we have only one common value of x, i.e., 34. **Hence (3)**

9. (3) From I : Y can either be Rs.60 or Rs.120
From Y = 60, X = 100
When Y = 120, X = 40
From II, x > 50, therefore the 2nd case does not apply.
$\therefore$ x =100; y =60
$\therefore$ Both statements are required. **Hence (3)**

10. (3) From I : $\angle B > \angle A$
From II : We know $B + C = 110^0$
$\therefore (B + C)^2 = 12{,}100$
$B^2 + 2BC + C^2 = 12{,}100$
$\therefore BC = 2400$
$\therefore B + \frac{2400}{B} = 110^0$
$B - 110B + 2400 = 0$
B = 80 OR B = 30
B > A
$\therefore \angle B = 180^0 - (70 + 80)^0$
$\angle C = 30^0$
$\therefore$ Both statements are necessary. **Hence (3)**

11. (2) Let the effectiveness of A, B, C and D be 5x, 6x, 4x and 3x respectively then, total effectiveness of Ajit's drug $\Rightarrow 12 \times 5x + 15 \times 6x + 20 \times 4x + 28 \times 3x = 314x$
that of Bittu's and drug $\Rightarrow 37 \times 5x + 15 \times 6x + 13 \times 4x + 15 \times 3x = 372x$
that of Chinku's drug $\Rightarrow 26 \times 5x + 15 \times 6x + 10 \times 4x + 34 \times 3x = 362x$

Alternatively,

The most effective drug B is in equal proportion in all drugs. Now the second most effective is A, Ajit's pharma can be easily eliminated as it has very less proportion of A compared to Bittu's and Chinku's drug.
Again, Ajit pharma: $37 \times 5 + 13 \times 4 + 15 \times 3 = 82$
Bittu's pharma : $26 \times 5 + 10 \times 4 + 34 \times 3 = 272$ **Hence (2)**

12. (3) Side effect $\frac{C}{B+E}$

For Ajit's drug, it I, $\frac{20}{15+25} = \frac{1}{2}$

For Bittu's drug, it is, $\frac{13}{15+20} = 0.37$

Fro Chinku's drug, it is, $\frac{10}{15+15} = \frac{1}{3}$. **Hence (3)**

13. (2) Let the new composition of E be 25 – x and that of be 20 + x.
then, $\frac{20+x}{15+25-x} \le 1$
$20 + x \le 20$
$x \le 10$
$\therefore$ Maximum composition of C is 20 + 10 = 30%. **Hence (2)**

14. (4) We cannot answer this, unless the production of individual companies are given. **Hence (4)**

15. (4)

16. (3) The discount in Kolkata ticket is Rs.3535
and the discount in Delhi ticket is Rs. 2175
So with Rs.3535 ticket for 17 destination can be bought (any one of them except Delhi0 and with Rs.2175 tickets for 4 destinations i.e. Ahemedabad, Pune, Indore and Aurangabad can be bought (any one of them 0. So answer is 17 & 4. **Hence (3)**

17. (4) Maximum discount in numerical terms is in Kolkata ticket.
It is 6855 – 3320 = Rs. 3535
Lowest discount same way for Aurangabad is 647 Rs.
So Rs. 3535 is almost 546% of Rs. 647. **Hence, (4)**

18. (3) less than 50%

19. (2)

	Case I		Case II	
	To	From	To	From
Delhi	6095	3920	3920	3920
Bhopal	4125	2371	2371	2371
Ahemedabad	3255	2017	2017	2017
indore	3360	1965	1965	1965
	16835	10273	10273	10273

So Expenditure in I case =27108
So Expenditure in II case = 20546
The solving in the second case = 6562it is approx. 24%. **Hence (2)**

20. (3) From the options, it is obvious that only the top 4% numbers must be evaluated.
The average size of the 3rd and 4th largest firms must be less than or equal to the average size of the first two firms.
Based on an inspection, the jump in textiles appears to be very large. The average fro the 3rd and 4th firms is $\frac{(18-8)}{2}=5$. However, the first two firms' average is only $\frac{8}{2}=4$. Hence, it is incorrect and needs to be corrected by subtracting 4%. **Hence (3)**
Only option (3) shows the correction by 4%.

21. (4) The solution lies in estimating the size of the largest firms as a proportion of the total industry.
Since the 3rd largest firms ≥ average of the 3rd and 4th firms, The 3rd largest firms ≥ $\frac{(75-60)}{2}$ or 7.5%
Hence, the 2nd largest firms ≥ 7.5% or the largest firms ⇐ 60 – 7.5 = 52.5%
Also, largest firms ≥ average of the top 2 firms
Hence, the largest firms ≥ 60/2 or 30%.
Hence, the size of the steel industry is between $\frac{5000}{0.525}$ (about 9500) and $\frac{5000}{0.3}$(16667). Hence, (4) is not possible **Hence (4)**

22. (2) It is obvious that steel, oil & gas shipping and Elevators have less than 20 firms.
Now, the average size of the top 10 firms ≥ the average size of all the remaining firms. Consider the leather industry. The average size of the top 10 firms = $\frac{10}{10}=1\%$. Hence, each of the remaining firms cannot be larger than 1% and there must be at least $\frac{90}{1}=90$ such firms. In all, then there must be at least 100 firms.
Similarity, Textiles has at least 17 firms. Hence, leather, textiles and chemicals definitely have at least 20 firms. **Hence (2)**

23. (4) Option (1) is a red herring and is false. Applying these rules, it can be seen that a maximum of 3 industries can face restrictions (Steel, Oil & Gas and Elevator). We do not know the number of industries where the largest firms is government owned. Hence, options (2) and (3) cannot be evaluated. **Hence (4)**

24. (2) Consider the current year. Maximum possible size of the 4^{th} largest firms = average of 3^{rd} and 4^{th} largest firms= $\frac{(75-60)}{2}$ = 7.55 of the industry. Assuming the remaining firms (the firms other than the top 4 firms) are the same size (7.5%), there would have been $\frac{100-75)}{7.5}$ or 3.33 or 4 firms other than the top 4. Hence, a total of at least 8 firms in this year. There were at least 2 mergers last year. Hence, last year's minimum = 8 + 2 =10. **Hence (2)**

25-28.

For this caselet consider possibilities one by one. E.g. first suppose Ria gets soup then Janet gets hot coffee (statement 1), Venna gets gums (statement 5) and Ria gets hot coffee (statement 9) which contradicts our supposition; hence, rejected.

Next suppose Gia gets soup then Ria gets gums (statement 11). Then if Janet get hot coffee, Veena gets gums (statement 5), which is not possible. So, Janet gets tea and remaining Veena gets hot coffee.

25. (1) 26. (3) 27. (2) 28. (4) 29. (3) 30. (3) 31. (2) 32. (4)

33. (2) Two other teams each must have at least 3 members.

34. (1) This team contains members from two of the original teams only.

35. (1) Since neither of two new teams has any member from team A3, both members of A3 will have to be accommodated in the third team which, however, is not allowed.

36. (3) 37. (1)

38-39 The second resident always speaks truth (so, not a govt. official) First speaker may speak truth (IS not & denies being a govt. official) or may tell a lie (is a govt. official but denies being one) – in either case denying being a govt. official. If first resident speaks truth the third one tells a lie and vice-versa.

38. (3) 39. (4)

40. (3) History of Modern Europe (HME) + American History (AH) = 90 + 90 = 180, but there are only 120 students. Thus, at least 60 students selected both of the above subjects. HME and AM + Ancient Indian History (AIH) = 60 + 105 = 165. Thus, again, as there are only 120 students, at least 45 would have taken all three of above. Using the same logic, (45 + 105) – 120 = 30 students at least would select all the four subjects.

EXERCISE 5

1. (4) The data is insufficient as the manufacturing cost of the liquor is not mentioned anywhere for any of the states.

2. (4) The data is insufficient, as the excise duty per litre for the year 1986 is not mentioned.

3. (4) The data is insufficient, as the amount of liquor supplied to four states is not mentioned. The amount of liquor supplied in Tamil Nadu is only mentioned and moreover for the first bar graph the year is not mentioned.

4. (4) The data is insufficient as the sales for the period is not mentioned in the question. Therefore, the answer is 4.

5. (1) The average value of the contract secured during the years = (100.5 + 67 + 141 + 143.9 + 65)/5 = 103.48

6. (2) Considering 1985 as the performance base of 100% i.e. 67 = 100% the figure for the indices for different years are shown in the table below:
Index is calculated as 67 = 100 (Base year 1985)
Index for 1984 is therefore = 100/67 × 100.5 = 150 (contract secured is 100.5)

7. (2) There is decline in contract secured only in the year 85 and 88 compared to the previous year. The highest % decline in the value of contract secured is for year 1988 = {(143.9 - 65)/143.9} × 100 = 54.82%

8. (2) The estimated cost of material in 1990 = 80 + 45 + 12 + 18 = 155.
The estimate cost in 1991 = 75 + 60 + 16 + 21 = 172
Cost of material rises by 5% and hence, the estimated cost will rise by the amount =.05 × (155 + 172) = 16.35.

9. (2) The ratio of cost of materials to labour cost = Total cost of material for the years/Total labour cost for the years Using the above formulae, the ratio comes as 8 : 1

10. (3) The total expenditure is required to be kept within Rs. 700 lakh.
The estimated total expenditure = Rs. (52.1 + 267.5 + 196.4 + 209.5) = Rs. 725.5 lakh
The amount to be cut down = Rs. (725.25 - 700) = Rs. 25.5 lakh
This amount is cut equally in all the years on expenditure of administration and hence cut in each year = Rs. 25.5/4 = Rs. 6.375 lakh.
% cut for year 1986 = (6.375/15) × 100 = 42.5%.

11. (4) Let the total length of the railway line to be laid is x km in the given years.
Length of line is proportional to the provision for material and labour cost.
That means x kms is laid for Rs. (sum of material and labour cost for the given years).
For Rs. 597.1 lakh, x km line is laid
Therefore by Rs. 175 lakh, (x/597.1) X 175 = 0.3x

12. (1) Total estimate = Rs. 725.5 Lakh; Estimate of contingencies = Rs. 25.2 lakh
Now the estimate of contingencies is doubled as it is felt inadequate = Rs. 50.4 % increase in total estimate = (25.2/725.5) × 100 = 3.47%

13. (2) At the end of 1990, the entire amount for the project has been spent = 725.5 lakh. For 1991, the amount spent = Rs. 209.5. The total amount spent on the project is Rs. (725.5 + 209.5) = Rs. 935 lakh. % by which the actual expenditure exceeds the estimated = {(209.5/725.5)} × 100 = 28.8%

14. (1) Referring table 5, we can directly say that % of blue sari sold is maximum in the region 2 = 33%

15. (2) Referring table 4, we can say directly say that minimum % of green sari is sold in region 6 = 14%

16. (4) Referring table 5, it is quite obvious that % of magenta saris sold is maximum for region 1 = 44%

17. (2) The popularity of any colour in any region can be checked by looking the % sale of that colour in that region i.e. referring table 4. The most popular colour in region 12 is brown

18. (3) Refer to table 3 to know % of saris sold to saris stocked for each colour in each region.
The region-colour combination that accounts for the highest % of sales to stock is (4, Brown) = 74%

19. (4) The area which was brought under irrigation in 1986-87 = (24 - 23.2) + (34.2 - 32.77) = 2.23 million hectares

20. (1) Consumption of chemical fertilisers per hectare of gross cropped area is given by {Total consumption of chemical fertiliser/gross cropped area}
The consumption of chemical fertiliser per hectare of gross cropped are is lowest for the year 1984-85 = (3.68 + 1.21 + 0.62)/173.1 = 0.0318 ton per hectare

21. (4) In year 1987-88 a part of minor irrigated area is brought under major and medium areas as it was the cumulative figures and hence data for minor irrigation for 1987-88 must be greater than the previous year, but it is not so.

22. (1) Refer to the table showing High yielding varieties. In year 1988-89, wheat jowar and bajra shows a decline from previous year and that is the maximum number of crop.

23. (3) The travelling time was 5000/66 hours. The stopping time was $1^2 + 2^2 + 3^2 + \ldots + 10^2$ minutes.

24. (3) If the number of children older than 5 years of age is x and the number of children younger than 5 years of age is y, then 5x + 6y = 43. The only values of x and y satisfying the equation are x = 5 and y = 3.

25. (2) P lies between 2371 and 2379. If P is divisible by 4, it could be 2372 or 2376. But if it is divisible by 9, it can only be 2376.

26. (2) $[(x^{-1} - y^{-1})/(x^{-2} - y^{-2})] = (1/x - 1/y)(1/x^2 - 1/y^2) = 1/(1/x + 1/y)$. If x and y are both greater than 2, 1/x and 1/y are both less than 0.5. Hence 1/x + 1/y is less than 1, or its reciprocal is greater than 1.

27. (3) x + z = 2x + (y - x) + (z - y) = 2x + 2 + 2 = 2x + 4. Since x is odd (dos not have a factor 2), 2x + 4 is not divisible by 4.

28. (3) Let the average speed from C to M be s, and the distance be x. Then from M to T, the speed is 2s and the distance is 0.3x. Average speed of the entire journey = distance / time = (x + 0.3x) / (x/s + 0.3x/2s) = 2.6s/2.3 = 40.

29. (2) If w is not older than V, he is younger than or the same age as Y. Hence Z is younger than X.

30. (4) The change in the prices of the two products over the next five years cannot be determined.

31. (2) x - y will always be 2. x + y < 10 does not specify the numbers.

32. (4) If CP is 80% of SP, then SP is 125% of CP, or the profit is 25%.

33. (1) If the length is I, the breadth is 48/1, and the diagonal is $\sqrt{[i^2 + (48/l)^2]} = 10$. Hence I can be found.

34. (3) If a price reduction of 50% enables me to buy 48 bananas in Rs. 12, I can buy 48 bananas for Rs. 24 at the original price. ∴ The price of a banana is 50 paise.

35. (4) The only two positive numbers whose squares add up to 116 are 4 and 10.

EXERCISE 6

Direction for 1 to 4: First of all derive a general formula for Bankatlal's monthly salary

	1 week	2 week	3 week	4 week
Hours of rest	X	Y	X	Y
Working hrs.	Y	X	Y	X

Thus for every month, 1st & 3rd week and 2nd week must be identical.
Salary per day in 1st & 3rd week = KY, where k = wage per hour
Salary per day in 2nd & 4th week = kX/2
Total monthly salary = 1{ky + kX/2} = 6k(2Y + X), where
x = hours of rest per day, Y = working hours per day in the 1st week of the month.

Direction for 1 to 4

1. (1) Fro the 1st month X = 2, Y = 5, so total salary = 6x 20 (2x 5 + 2) = Rs. 1440.

2. (3) Total salary for 4 months = [1440 + 120 {(2 × 7 + 3) + (2x 6 + 4) + (2x 8)}] = Rs. 7320

Average Salary = $\frac{7320}{4}$ = Rs.1830.

3. (2) Under New Scheme salary per day in 9th & 11th week = 25 × 6 - 5x4 = Rs. 130
Under New Scheme salary per day in 10th & 12th week = 25 × 4 - 4x6 = Rs. 70
Under New Scheme total salary for 3rd month = 12 (130 + 70) = Rs. 2400
Under previous scheme total salary for 3rd month = 120 (2 × 6 + 4) = Rs. 1920
Difference = 2400 - 1920 = Rs. 480.

4. (2) As per the conditions salary for first 3 months = (!440 + 2040 + 2400) = Rs. 5880
For 4th month salary per day in 13th & 15th week = 8 × 25 = Rs. 200
For 4th month salary per day in 14th & 16th week = - 8 × 5 = (- 40)
Total salary for 4th month = 12 (200 - 40) = Rs. 1920
Total salary for 16 weeks = {1440 + 2040 + 2400 + 19

5. (2) In order to manufacture maximum number of units, make Q on both the machines as time taken for manufacturing one unit of Q is less on both the machines. And maximum number of units obtained = {(8 + 8) × 60}/6 = 160.

6. (1) As per the given condition number of units of P should be three times that of Q. One unit of P takes less time on M2 as compared to that on M1. So manufacture P on all the time available on M1, number of units of P obtained = (8 × 60)/8 = 60. Now number of units of Q required to fulfil the given condition = (60/3) = 20. Time taken to manufacture 20 units of Q on M2 = 20 × 6 = 120 min. Remaining time available on machine M2 = (8 × 60) - (120) = 360 min. In this time manufacture 3 units of P followed by 1 unit of Q & continue till all the available time is utilised. Time taken to manufacture 3 units of P & 1 unit of Q on M1 = (3 × 8 + 6) = 30 min. Thus in 360 min 36 units of P & 12 units of Q will be manufactured & idle time will be zero.

7. (3) Here four different method is given and to compare each method we will bring them into common platform so that we can compare them. Taking the LCM of 48, 64, 53 and 71 which will give total number quantities to be manufactured and hence we will see which method is taking maximum idle machine hour to manufactured this number of quantities. LCM of 48, 64, 53 and 71 = 722496
By method a) Total idle machine hours (722496 × 3)/48 = 45156 min
b) Total idle machine hours (722496 × 12)/64 = 135468 min
c) Total idle machine hours (722496 × 10) = 136320 min
d) Total idle machine hours (722496 × 9)/71 = 91584

From above it is very clear that method c) is maximum idle hours hence it is the least efficient method. Answer is 3).

8. (4) If M1 works at half of its normal efficiency, time taken by M1 to manufacture 1 unit of P = 20 min. and Q = 12 min. And now maximum number of units obtained = $(8 \times 60)/12 + (8 \times 60 - 8)/6 + 1 = (41 + 472/6) = 119$ (consider only complete units).

9. (1) In order to take minimum time manufacture P on M2 & Q on M1. Number of machine hours required = $(30 \times 8 + 25 \times 6)/60 = 6.50$ hours.

10. (1) Total requirement of cloth = Total number of shirts x cloth required per shirt = $(20 + 30 + 30 + 10 + 10)\ 1000 \times 1.5 = 150{,}000$ m.

11. (3) Total quantity of high quality cloth consumed by A shirts = $(80\% \text{ of } 20000) \times 1.5 = (4/5) \times 30000 = 24{,}000$ m.

12. (2) Required Ratio = $(40\% \text{ of } 30000)/(60\% \text{ of } 10{,}000) = 2 : 1$.

13. (2) Total low quality cloth consumed = $1.5\ \{(3/10)x60 + (2/5) \times 10 + (9/10) \times 10\}\ 1000 = 46{,}500$ m.

14. (3)

15. (3) One can logically assume that a test will be feasible if its relative cost is lower than that of any other test. Test -2 has the lowest relative cost in the range 0.05% to 0.2%, so the answer is (c).

16. (4) For $p = 0.2$, both, Test-2 and Test - 3 have the same relative cost, so both of them are feasible.

17. (1) Test-3 has the lowest relative cost for the range $p > 0.2$, so Test - 3 will be the best option to adopt for $p > 0.2$.

18. (1) In the range $0.00 < p < 0.05$, Test - 1 has the lowest relative cost, so the answer is (a), i.e. $p < 0.05$.

19. (4) If $p < 0.2$, then initially Test-1 is more feasible, while thereafter, Test -2 is a better option. While we cannot say from the data given in the question, which of these two tests is better, we can definitely say that Test-3 is the most expensive test for the range $p < 0.2$.

20. (3)	**24. (3)**	**28. (4)**
21. (3)	**25. (3)**	**29. (2)**
22. (4)	**26. (2)**	**30. (1)**
23. (3)	**27. (1)**	**31. (3)**

32. (3) dozen organs are equivalent to 4 kg mangoes, hence 14 kg mangoes cost Rs. 252.

33. (3) If tz is odd, both t and z are odd. If x + y + t is even, x + y + t - z odd.

34. (3) If the altitude to the base of an isosceles triangle is known, the base can be found, and hence the area.