

FIITJEE

MUKHYAMANTRI VIGYAN PRATIBHA PARIKSHA

PART – I

MENTAL ABILITY TEST (MAT)

Held on: March 28, 2021

QUESTION PAPER

- Average weight of a group of 6 girls is 26. If we replace a girl of weight 30 in the group with another girl so that new average increases by 5. Find the weight of new girl.
1. 30
2. 40
3. 50
4. 60
- The difference between compound interest and simple interest of a certain sum is 10, While interest is provided @5% p.a for 2 years. Find the sum.
1. 3000
2. 4000
3. 4500
4. 5000
- Tarun is younger than Taukeer by 8 years and ratio of their ages is 7:9 what is the age of Taukeer?
1. 36
2. 63
3. 45
4. 54
- The present age of Ram, Rahim and Robert are in proportion of 5:7:8. Six years ago, the sum of their ages is 42. Find their present ages.
1. 20, 25, 30
2. 25, 35, 40
3. 20, 28, 32
4. 15, 21, 24
- A train 125m. long passes a man, running at 5 km/hr in the same direction in which the train is going, in 10 seconds. The speed of the train is:
1. 45 km/hr
2. 50 km/hr
3. 54 km/hr
4. 55 km/hr
- Today is Wednesday, after 68 days, it will be
1. Monday
2. Tuesday
3. Wednesday
4. Thursday
- There are 7 girls on a bus and each girl has 7 backpacks. In each backpack, there are 7 big cats, for every big cat, there are 7 kittens on bus. How many legs are on the bus, not counting the driver?
1. 10000
2. 11000
3. 10990
4. 9990
- What will be appear in '?'

50	60	70
87	90	93
43	?	25

- 40
3. 60
- 75
4. 34

Directions (Questions 9 - 13): Study the following pie – chart carefully and answer the following questions – Distribution of candidates who were enrolled for MBBS entrance exam and the candidates (out of those enrolled, who passed the exam in different institutions (P, Q, R, S, T, V,X) is given in the following pie - chart)



Candidate enrolled = 9500



Candidate who passed the exam = 5700

9. What percentage of candidates passed the exam from Institution T out of the total number of candidates enrolled from same Institution?
 1. 50%
 2. 62.5%
 3. 67.5%
 4. 80%
10. Which institute has the highest percentage of candidates passed to the candidates enrolled.
 1. P
 2. Q
 3. R
 4. S
11. The number of candidates passed from Institutes S and P together exceeds the number of candidates enrolled from Institute T and R together by:-
 1. 250
 2. 299
 3. 270
 4. 228
12. What is the percentage of candidates passed to the candidate enrolled for institutes Q and R together?
 1. 60%
 2. 70%
 3. 76.8%
 4. 90%
13. What is the ratio of candidates passed to the candidates enrolled from institute P?
 1. 4:11
 2. 56:61
 3. 11:19
 4. 54:95
14. On increasing the price of ticket of zoo by 30% the visitors will be decreased by 20%. What will be the effect on revenue?
 1. Increase by 10%
 2. Decrease by 10%
 3. Increase by 4%
 4. Decrease by 4%

15. Find the odd one out:
2, 5, 10, 17, 26, 37, 48, 65
- | | |
|-------|-------|
| 1. 17 | 2. 37 |
| 3. 48 | 4. 26 |

16. Find the missing figure in the series:-
18, 97, 26, 89, ?, 81
- | | |
|-------|-------|
| 1. 21 | 2. 34 |
| 3. 42 | 4. 10 |

Directions (Questions 17 - 19): In the following question there is a letter series with one term missing shown by (?). Find the term from the four given alternatives.

17. B, F, J, ?, R
- | | |
|------|------|
| 1. N | 2. P |
| 3. M | 4. O |

18. B, C, ? G, K
- | | |
|------|------|
| 1. F | 2. D |
| 3. E | 4. J |

19. CNL, BLI, AJF, ZHC, ?
- | | |
|--------|--------|
| 1. XDY | 2. YFZ |
| 3. YFA | 4. XFY |

20. Marathon is to race as hibernation is to -
- | | |
|-----------|----------|
| 1. Winter | 2. Bear |
| 3. Dream | 4. Sleep |

21. Cup is to coffee as bowl is to
- | | |
|----------|---------|
| 1. Dish | 2. Soup |
| 3. Spoon | 4. Food |

22. A train running at the speed of 60 km/hr. crosses a pole in 9 seconds. What is the length of the train?
- | | |
|---------------|---------------|
| 1. 120 metres | 2. 180 metres |
| 3. 324 metres | 4. 150 metres |

23. Pointing to a photograph of a boy Ramesh said, 'He is the son of the only son of my mother'. How is Ramesh related to that boy?
- | | |
|------------|-----------|
| 1. Brother | 2. Uncle |
| 3. Cousin | 4. Father |

24. If A + B means A is the brother of B; A - B means A is the sister of B and A x B means A is the father of B. Which of the following means that C is the son of M?
- | | |
|------------------|------------------|
| 1. M - N x C + F | 2. M x N - C + F |
| 3. N + M - F x C | 4. F - C + N x M |

Directions (Questions 25 – 28): The cards bearing letters of the word 'MATHEMATICS' are placed in a bag. A card is taken out from the bag without looking into the bag at random.

25. What is the probability of getting 'M'?
- | | |
|-------------------|-------------------|
| 1. $\frac{2}{11}$ | 2. $\frac{4}{11}$ |
| 3. $\frac{3}{11}$ | 4. $\frac{5}{11}$ |
26. What is the probability of getting a vowel?
- | | |
|-------------------|-------------------|
| 1. $\frac{2}{11}$ | 2. $\frac{4}{11}$ |
| 3. $\frac{3}{11}$ | 4. $\frac{5}{11}$ |
27. What is the probability of getting a consonant?
- | | |
|-------------------|-------------------|
| 1. $\frac{2}{11}$ | 2. $\frac{4}{11}$ |
| 3. $\frac{7}{11}$ | 4. $\frac{5}{11}$ |
28. What is the probability of getting 'X'?
- | | |
|-------------------|-------------------|
| 1. $\frac{2}{11}$ | 2. $\frac{4}{11}$ |
| 3. $\frac{3}{11}$ | 4. 0 |
29. A boat takes 8 hours to move downstream from point P to Q and to return to point P moving upstream. If the speed of the stream is 4 km/hr and the speed of the boat in still water is 8 km/hr, what is the distance between point P and Q.
- | | |
|---------|---------|
| 1. 14km | 2. 48km |
| 3. 24km | 4. 16km |
30. A number of friends decided to go on a picnic and planned to spend Rs 96 on eatables. Four of them, however, did not turn up as a consequence, the remaining ones had to contribute Rs 4 each extra. The number of those who attended the picnic was
- | | |
|-------|-------|
| 1. 8 | 2. 12 |
| 3. 16 | 4. 24 |
31. The circumference of a jogging track is 700 meter. Prashant and Tanu start walking from the same time in opposite direction. If they are walking at 6 km/hr and 8 km/hr respectively, after how much time they will meet?
- | | |
|----------|----------|
| 1. 2 min | 2. 4 min |
| 3. 3 min | 4. 5 min |
32. If price of soap A is 25% more than the price of soap B, then price of soap B is how much less than price of soap A?
- | | |
|--------|--------|
| 1. 25% | 2. 30% |
| 3. 20% | 4. 15% |
33. $\frac{1}{2}$ and $\frac{1}{4}$ parts of two bottles are filled with milk. The bottles are then filled completely with water and the content of bottles is poured into a container. Find the ratio of the milk and water in the container?
- | | |
|--------|--------|
| 1. 3:5 | 2. 2:1 |
| 3. 1:2 | 4. 5:3 |
34. Two containers A and B contain mix of water and milk in the ratio of 5:2 and 7:6 respectively. Find the ratio in which these two mixtures can be mixed so that a new mixture formed in the container C in the ratio of 8:5 –
- | | |
|--------|--------|
| 1. 2:7 | 2. 7:9 |
| 3. 9:7 | 4. 5:7 |
35. If $2^{x-1} + 2^{x+1} = 320$, then x is equal to
- | | |
|------|------|
| 1. 5 | 2. 6 |
| 3. 7 | 4. 8 |

36. Value of $(256)^{0.16} \times (256)^{0.09}$ is –
1. 16
 2. 8
 3. 10
 4. 4
37. The area of a rectangular plot is increased by 30% and its width remain as it was before. What will be the ratio between the area of new rectangle and the original rectangle?
1. 13:10
 2. 10:13
 3. 7:3
 4. 3:7
38. If A : B, B:C and C:D
1:2, 3:2 1:3
Then find A:B:C:D
1. 1:3:4:6
 2. 3:6:4:12
 3. 1:2:3:4
 4. 1:2:3:2

Directions (Questions 39 – 40): See the following data related to salary and bonus of different workers:

Post	No. of Employers	Annual Salary	Bonus%
Manager	3	5, 40, 000	40%
Worker	5	1, 20, 000	30%
Trainee	4	60, 000	20%

39. What is the average bonus?
1. 72, 000
 2. 73, 000
 3. 60, 000
 4. 50, 000
40. What is the average salary?
1. 2, 00, 000
 2. 2, 40, 000
 3. 2, 05, 000
 4. 2, 10, 000

Directions (questions 41 – 43): Following table is the record of Revenue, cost and tax of a company.

Year	Revenue	Cost
2012	800	600
2013	1100	850
2014	1200	900
2015	1200	1000
2016	1350	1050
2017	1500	1200
2018	1600	1200
2019	1850	1400

41. Which two years has similar profit after tax?
1. 2016 and 2017
 2. 2017 and 2018
 3. 2018 and 2019
 4. 2012 and 2013
42. What is the percentage change in profit after tax from 2015 to 2016?
1. 40% increase
 2. 40% decrease
 3. 20% increase
 4. 20% decrease
43. What is the ratio of profit after tax between 2014 and 2013?
1. 5:6
 2. 3:4
 3. 6:5
 4. 7:8

Directions (Questions 44 – 48): The students of class IX have to choose one club from Music, Yoga, Fine Arts, Dramatics and Dance. The Data given below shows the choice made by girls and boys of the class study the table and answer the questions.

Club	Dance	Dramatics	Find Arts	Yoga	Music
Girls	31	19	27	10	15
Boys	10	17	21	17	12

44. How many students are there in class IX?
 1. 189
 2. 169
 3. 179
 4. 173
45. Which is the most preferred club by girls?
 1. Music
 2. Dance
 3. Find Arts
 4. Dramatics
46. Which is the least preferred club by boys?
 1. Music
 2. Dance
 3. Find Arts
 4. Dramatics
47. For which club the difference between boys and girls is the least?
 1. Music
 2. Dance
 3. Find Arts
 4. Dramatics
48. For which club difference between boys and girls is the maximum?
 1. Music
 2. Dance
 3. Find Arts
 4. Dramatics
49. The ratio of land and water on earth is 1:2. In the northern hemisphere the ratio is 2:3. What is the ratio in the southern hemisphere?
 1. 1:11
 2. 2:11
 3. 3:11
 4. 4:11
50. Which least number should be subtracted from 1936 so that the resulting number, when divided by 9, 10 and 15, will leave the same remainder 8 in each case?
 1. 39
 2. 38
 3. 37
 4. 36
51. If 30% of $x = y$, then $y\%$ of 40 is same as:
 1. 6% of x
 2. 8% of x
 3. 12% of x
 4. 16% of x
52. Two trains 600 m and 400 m long are running in opposite directions on parallel tracks. Their speeds are 40 km/h and 32 km/h respectively. Find the time taken by two trains to cross each other.
 1. 40 sec.
 2. 50 sec.
 3. 54 sec.
 4. 48 sec.
53. If $x^2 + \frac{1}{x^2} = 51 (x > 0)$, then the value of $x^3 + \frac{1}{x^3}$ is:
 1. 343
 2. 322
 3. $49\sqrt{7}$
 4. 364

54. If $x = 3 + 2\sqrt{2}$ and $y = 5 - 2\sqrt{6}$ then the value of $\sqrt{x} + \sqrt{y}$ is:
- | | |
|--------------------------|--------------------------|
| 1. $1 + \sqrt{3}$ | 2. $\sqrt{2} + \sqrt{3}$ |
| 3. $\sqrt{3} - \sqrt{2}$ | 4. $\sqrt{3} - 1$ |
55. Ravi cycling at a constant speed of 8 km/h reaches the school 6 minutes late. If he cycles at a constant speed of 12 km/hr he reaches the school 6 minutes early. How many km he has to cycle for his school?
- | | |
|-----------|-----------|
| 1. 5 km | 2. 4.8 km |
| 3. 6.4 km | 4. 4.4 km |

Directions (Q.56 – Q.62): Identify the wrong number / letter in the series:

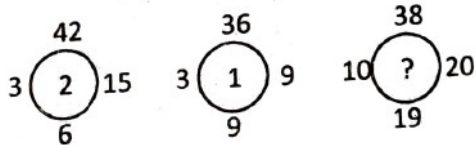
56. 132, 104, 80, 48, 20
- | | |
|--------|-------|
| 1. 104 | 2. 80 |
| 3. 132 | 4. 48 |
57. 1, 3, 7, 15, 31, 65, 127
- | | |
|-------|-------|
| 1. 7 | 2. 31 |
| 3. 65 | 4. 15 |
58. 6, 30, 60, 120, 210
- | | |
|--------|--------|
| 1. 30 | 2. 60 |
| 3. 120 | 4. 210 |
59. AD, EG, IJ, MM, QP, UP
- | | |
|-------|-------|
| 1. EG | 2. UP |
| 3. QP | 4. MM |
60. 5, 13, 25, 40, 61, 85
- | | |
|-------|-------|
| 1. 40 | 2. 61 |
| 3. 85 | 4. 13 |
61. 2, 12, 30, 80, 150
- | | |
|--------|-------|
| 1. 12 | 2. 80 |
| 3. 150 | 4. 30 |
62. 0, 4, 18, 45, 100
- | | |
|-------|-------|
| 1. 0 | 2. 18 |
| 3. 45 | 4. 4 |
63. If South-West becomes North, then what North-East becomes?
- | | |
|---------|---------------|
| 1. West | 2. South |
| 3. East | 4. South-West |
64. Raman is 15th from the front in a column of boys. There were thrice as many behind him as there were in front. How many boys are there between Raman and the seventh boy from and the seventh boy from the end of the column?
- | | |
|-------|--------------------|
| 1. 33 | 2. 34 |
| 3. 35 | 4. Data inadequate |
65. In a row of girls, there are 16 girls between Priya and Natasha. Priya is 32nd from the left end of the row. If Priya is nearer than Natasha to the right ends of the row, then how far is Natasha from the left end of row?
- | | |
|---------------------|---------------------|
| 1. Data inadequate | 2. 14 th |
| 3. 15 th | 4. 16 th |

Directions (Q.66 – Q.70): Study the following information carefully and answer the questions given below:

P is the father of R, but R is not his son. T is the daughter of R. U is the wife of P. Q is the brother of R. S is the son of Q. V is the wife of Q. W is the father of V.

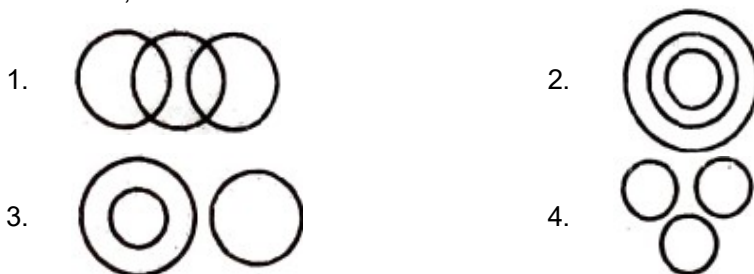
66. Who is the paternal grandmother of S?
 1. W
 2. P
 3. R
 4. U
67. Who is the son of U?
 1. Q
 2. R
 3. T
 4. S
68. Who is father-in-law of Q?
 1. R
 2. P
 3. T
 4. W
69. Who is the sister-in-law of R?
 1. S
 2. V
 3. U
 4. T
70. Who is the cousin of T?
 1. R
 2. Q
 3. W
 4. S

71. What value will replace “?” in the figures given below:



1. 0
 2. 1
 3. 2
 4. 3
72. In the following matrix, certain numbers are arranged in a certain way. Choose the missing number to complete the matrix.
- | | | |
|---|----|----|
| 2 | 5 | 8 |
| 3 | 7 | ? |
| 8 | 40 | 80 |
1. 12
 2. 9
 3. 6
 4. 15
73. IF ‘-’ stands for ‘÷’, ‘+’ stands for ‘×’, ‘÷’ stands for ‘-’ and ‘×’ stands for ‘+’. Which of the following equation is correct?
 1. $40 - 10 + 5 \div 4 \times 5 = 21$
 2. $40 + 10 - 4 \times 5 \div 3 = 80$
 3. $40 \div 10 - 4 \times 5 + 3 = 32$
 4. $8 - 4 \times 40 \div 2 + 15 = 30$

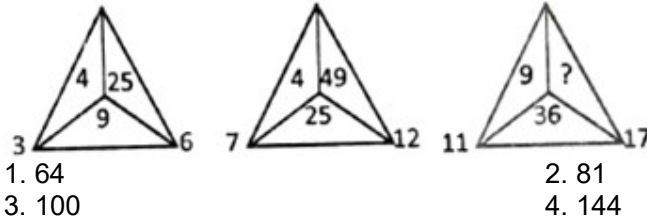
74. Which of the following Venn diagram truly represents the relationship between Animals, Mammals, Goat.



75. Find the ratio in which wheat at Rs.14.40 per kg be mixed with wheat at Rs.11.40 per kg to produce a mixture worth Rs.12.60 per kg?
1. 1:2
 2. 3:4
 3. 2:3
 4. 4:5

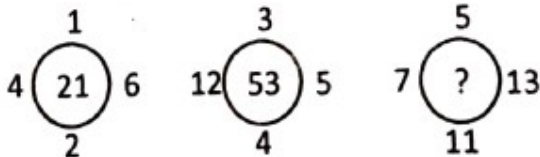
Direction: (Q.76 and Q.77): Find the missing number in the following figures:.

76.



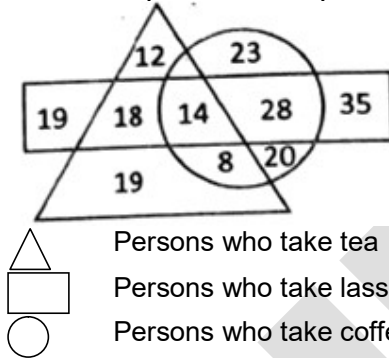
1. 64
2. 81
3. 100
4. 144

77.



1. 75
2. 70
3. 107
4. 73

Direction: (Q. 78 to Q.82): Study the diagram and answer each of the following.



78. How many persons take tea and lassi but not coffee?
1. 18
 2. 14
 3. 22
 4. 24
79. How many persons are there who take both tea and coffee but not lassi?
1. 18
 2. 14
 3. 8
 4. 12
80. How many persons take lassi?
1. 81
 2. 93
 3. 98
 4. 114
81. How many persons are there who take only coffee?
1. 34
 2. 43
 3. 38
 4. 49
82. How many persons take all the three?
1. 8
 2. 14
 3. 18
 4. 12

83. $\sqrt{10 + \sqrt{x + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}} = 4$

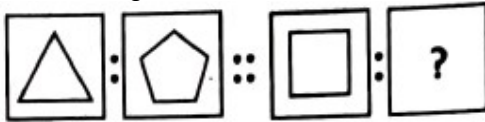
Find the value of x.

1. 16
 2. 21
 3. 25
 4. 36

84. If 'DIVINE' is coded as 'AFSFKB' then 'POWERFUL' is coded as

1. XLHOJVIM
 2. MILTBDCRI
 3. MLTBOCRI
 4. HLTBNCRI

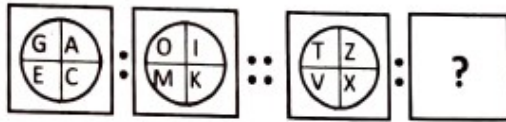
85. Question figure



Answer figure

1.  2. 
 3.  4. 

86. Question figure

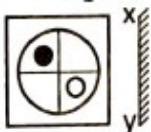


Answer figure


1.  2. 
 3.  4. 

Direction: (Q.87 and Q.88): If a mirror is kept on a line, Which is image figure?

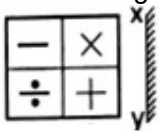
87. Question figure



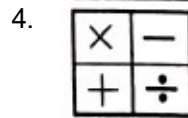
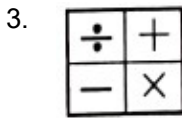
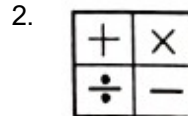
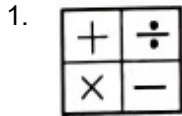
Answer figure

1.  2. 
 3.  4. 

88. Question figure



Answer figure



Direction: (Q. 89 to Q.93): Find the missing numbers in given figures.

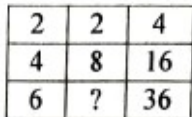
89.



1. 54
3. 48

2. 51
4. 44

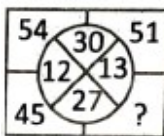
90.



1. 32
3. 48

2. 15
4. 18

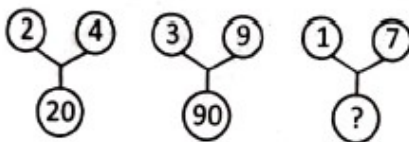
91.



1. 39
3. 48

2. 42
4. 66

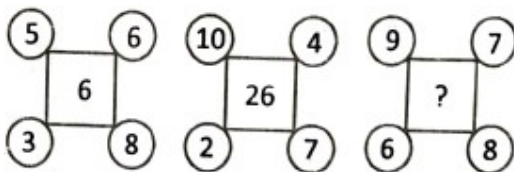
92.



1. 20
3. 50

2. 25
4. 75

93.



1. 13
3. 36.

2. 15
4. 16

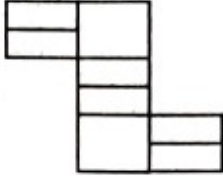
94. Three position of dice are given below



to find the opposite face of 6.

- | | |
|------|------|
| 1. 1 | 2. 4 |
| 3. 5 | 4. 7 |

95. How many rectangles are there in a given figure?



- | | |
|--------|-------|
| 1. 8 | 2. 18 |
| 3. 19. | 4. 20 |

96. The correct arrangement of alphabetical order of the words.

- a) Million b) Monarch
c) Monk d) Minimum

- | | |
|---------------|---------------|
| 1. a, b, c, d | 2. b, a, c, d |
| 3. c, b, a, d | 4. a, d, b, c |

97. Pointing to a woman in a photograph a man say, "She is the only daughter of my father's mother-in-law". How is the woman related to the man?

- | | |
|--------------------|------------------|
| 1. Daughter | 2. Mother |
| 3. Daughter-in-law | 4. Mother-in-law |

98. A 6cm cube is cut into 2cm small cubes. How many small cubes can be obtained from this?

- | | |
|--------|--------|
| 1. 108 | 2. 156 |
| 3. 27 | 4. 64 |

Direction: (Q.99 and Q.100): Identify the diagram that best represents the relationship among the classes given below:

99. Police, Thief, Criminal

- | | |
|----|----|
| 1. | 2. |
| 3. | 4. |

100. District, State, Country

- | | |
|----|----|
| 1. | 2. |
| 3. | 4. |

FIITJEE

MUKHYAMANTRI VIGYAN PRATIBHA PARIKSHA PART – I

MENTAL ABILITY TEST (MAT)

Held on: March 28, 2021

ANSWERS

1.	4	2.	2	3.	1	4.	4
5.	2	6.	1	7.	3	8.	4
9.	3	10.	3	11.	4	12.	3
13.	4	14.	3	15.	3	16.	2
17.	1	18.	3	19.	2	20.	4
21.	2	22.	4	23.	4	24.	2
25.	1	26.	2	27.	3	28.	4
29.	3	30.	1	31.	3	32.	3
33.	1	34.	2	35.	3	36.	4
37.	1	38.	2	39.	2	40.	3
41.	Data Insufficient	42.	Data Insufficient	43.	Data Insufficient	44.	3
45.	2	46.	2	47.	4	48.	2
49.	4	50.	2	51.	3	52.	2
53.	4	54.	1	55.	2	56.	2
57.	3	58.	1	59.	2	60.	1
61.	4	62.	3	63.	2	64.	3
65.	3	66.	4	67.	1	68.	4
69.	2	70.	4	71.	1	72.	2
73.	1	74.	2	75.	3	76.	2
77.	1	78.	1	79.	3	80.	4
81.	2	82.	2	83.	3	84.	3
85.	3	86.	4	87.	2	88.	4
89.	1	90.	4	91.	2	92.	3
93.	2	94.	2	95.	2	96.	4
97.	2	98.	3	99.	1	100.	2

HINTS AND SOLUTIONS

1. 4
1. Total weight of 6 girls = $26 \times 6 = 156$
Let weight of new girl = x
According to question new total weight = $156 + x - 30 = 31 \times 6$
 $\Rightarrow x = 60$
2. 2
2. S1 for 1 year = $\frac{P \times 5 \times 1}{100} = \frac{P}{20}$ (P is principal)
Now according to questions, $\frac{P}{20} \times 5 \times 1 = 10$
 $\Rightarrow P = 4000$ Rs
3. 1
3. Let Taukeer's age = x years
and Tarun's age = y years
 $\therefore x - 8 = y \dots(1)$
And $\frac{y}{x} = \frac{7}{9} \dots(2)$
Solving above 2 equations we get $x = 36$ years
4. 4
4. Let Ram's age = $5x$ years
Rahim's age = $7x$ years
And Robert's age = $8x$ years
 $\therefore (5x - 6) + (7x - 6) + (8x - 6) = 42$
 $\Rightarrow x = 3$
 \therefore Their present ages = 15, 21, 24
5. 2
5. Let speed of train = x km/hr
 $\therefore \frac{125}{1000} = (x - 5) \times \frac{10}{60 \times 60}$
Solving, we get $x = 50$ km/hr
6. 1
6. Today is Wednesday, so after 63 days i.e. after (7×9) days it will be Wednesday again so after 5 days (i.e., $68 - 63$) it will be Monday.
7. 3
7. Number of girls = 7
Number of back packs = $7 \times 7 = 49$
Number of big cats = $49 \times 7 = 343$
Number of kittens = $343 \times 7 = 2401$
Number of legs = $(2401 + 343) \times 4 + 7 \times 2 = 10990$
8. 4
8. $\frac{50 + 70}{2} = 60, \frac{87 + 93}{2} = 90$
Similarly, $\frac{43 + 25}{2} = 34$

9. 3
 9. $\frac{513}{760} \times 100 = 67.5\%$

	Enrolled	Passed	Percentage (Passed to enrolled)
P	1805	1026	56.8
Q	1425	1083	76
R	950	741	78
S	1900	912	48
T	760	513	67.5
V	1140	855	75
X	1520	570	37.5
Total	9500	5700	

10. 3
 10. From above table clearly highest percentage of passed to enrolled candidates is of R

11. 4
 11. $(1026 + 912) - (950 + 760) = 228$

12. 3
 12. $\frac{(1083 + 741)}{(1425 + 950)} \times 100 = 76.8\%$

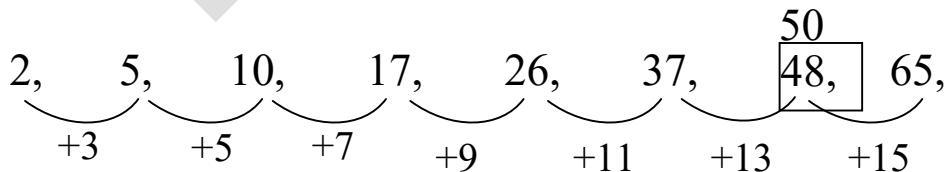
13. 4
 13. $\frac{1026}{1805} = \frac{1026 \div 19}{1805 \div 19} = \frac{54}{95}$

14. 3

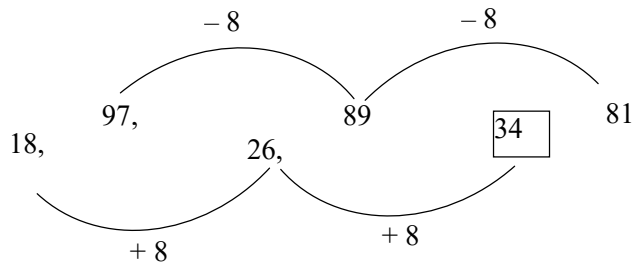
	Initial	New
Price	x	$\frac{130x}{100} = \frac{13x}{10}$
Visitors	y	$\frac{80y}{100} = \frac{4y}{5}$
Revenue	xy	$\frac{52xy}{50} = \frac{104xy}{100}$

Clearly revenue will increase by 4%

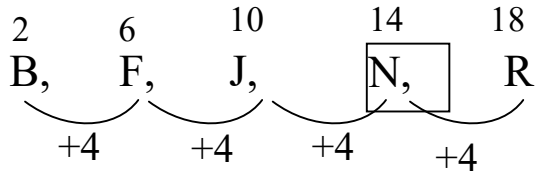
15. 3
 15.



16. 2
16.



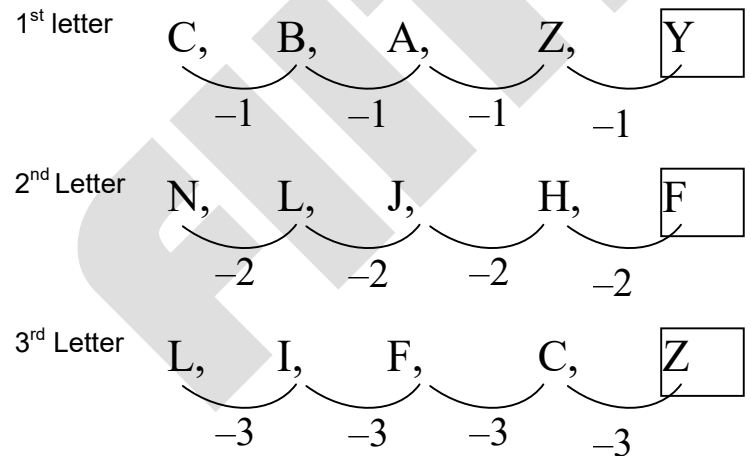
17. 1
17.



18. 3
18. 2 3 5 7 11
B C E G K

Position number of letters is prime number.

19. 2
19.



20. 4
20. As marathon is the long distance race similarly hibernation is long period of sleep.

21. 2
21. We have cup for coffee, similarly we use bowl for soup.

22. 4

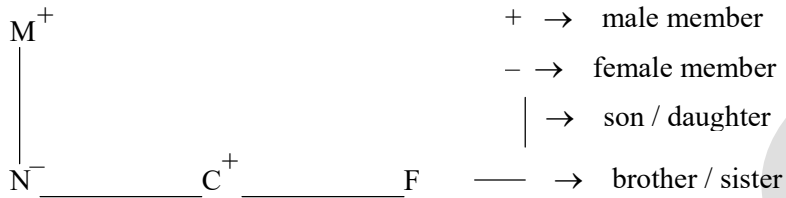
22. Length of train = $\left(60 \times \frac{5}{18}\right) \times 9 = 150 \text{ m}$

23. 4

23. Only son of Ramesh's mother is Ramesh himself and son of only son means Ramesh's son, So, Ramesh is father of that boy.

24. 2

24.



25. 1

25. Probability of getting 'M'
⇒ MATHEMATICS
Total number of letter M = 2
Total number of words in MATHEMATICS = 11

26. 2

26. Probability of getting vowel
Breakup of Mathematics
11 – letters
7 – consonant
4 – vowels → $P(\text{vowel}) = 4/11$

27. 3

27. Probability of getting vowel
Breakup of Mathematics
11 – letters
7 – consonant
4 – vowels → $P(\text{consonant}) = 7/11$

28. 4

28. As in the word MATHEMATICS there is no 'X'. So, probability of getting X is 0

29. 3

29. If the distance between P and Q is x

$$\frac{x}{8+4} + \frac{x}{8-4} = 8$$

$$x = \frac{x}{12} + \frac{x}{4} = 8$$

$$\frac{x}{12} = 8$$

$$x = 24$$

30. 1
 30. If the total number of friends decided to go on picnic is x

$$\frac{96}{x-4} - \frac{96}{x} = 4$$

$$= 12$$
 The number of friends actually went to picnic is $= 12 - 4 = 8$

31. 3
 31. Circumference of jogging track = 700 m
 $= \text{speed} = (6 \text{ km} + 8 \text{ km})$ as they are going in same direction
 $= 14 \text{ km} \times \frac{5}{18} =$
 $= \frac{700 \times 18}{14 \times 5} = 3 \text{ min}$

32. 3
 32. Let the price of B = 100
 Price of A = 125
 Required percentage $= \frac{125 - 100}{125} = \frac{25}{125} \times 100 = 20\%$

33. 1
 33. Required ratio of milk and water $= \frac{\frac{1}{2} + \frac{1}{4}}{\frac{1}{2} + \frac{3}{4}} = \frac{3}{5}$

34. 2
 34. Container A Container B
 $\frac{5}{7}$ $\frac{7}{13}$
 $\frac{8}{13}$
 $\frac{8}{13} - \frac{7}{13}$ $\frac{5}{7} - \frac{8}{13}$
 $\frac{1}{13}$ $\frac{68 - 56}{91} = \frac{9}{91}$
 7:9

35. 3
 35. $2^{x-1} + 2^{x+1} = 320$

$$\frac{2^x}{2} + 2^x \cdot 2 = 320$$

$$\Rightarrow 2^x \left(\frac{1}{2} + 2 \right) = 320$$

$$\Rightarrow 2^x \times \frac{5}{2} = 320$$

$$\Rightarrow 2^x = \frac{2 \times 320}{5}$$

$$2^x = 2^1 \times 2^6$$

$$2^x = 2^7$$

$$\therefore x = 7$$

36. 4

36. $(256)^{0.16} \times (256)^{0.09}$

$$256 = 16^2 = (4^2)^2 = 4^4$$

$$256^{0.16+0.09} = (256)^{0.25}$$

$$= (4^4)^{\frac{1}{4}}$$

$$= 4$$

37. 1

37. Suppose the area of rectangular plot = 100
 The increased area will be = 130
 $\frac{\text{The area of new rectangle}}{\text{The area of original rectangle}} = \frac{130}{100}$

38. 2

38. $\frac{A}{B} = \frac{1}{2}, \frac{B}{C} = \frac{3}{2}, \frac{C}{D} = \frac{1}{3}$

$$\frac{1}{2} \times \frac{3}{3} \cdot \frac{3 \times 2}{2 \times 2} \cdot \frac{1}{3} \times \frac{2 \times 2}{2 \times 2}$$

A : B : C : D
 3 : 6 : 4 : 12

39. 2

39. For managers,
 Salary = 5, 40, 000
 Bonus = 40%
 \therefore Bonus in rupees = 40% of 5, 40, 000
 $= \frac{40}{100} \times 540000$
 $= 216000$

For workers
 Salary = 1,20,000
 Bonus = 30%
 Bonus in rupees = 30% of 120000

$$= \frac{30}{100} \times 120000$$

$$= 36000$$

For Trainee

Salary = 60,000

Bonus = 20%

∴ Bonus in rupee = 20% of 60000

$$= \frac{20}{100} \times 60000$$

$$= 12000$$

Average bonus

$$= \frac{3 \times 216000 + 5 \times 36000 + 4 \times 12000}{3 + 4 + 5}$$

$$= \text{Rs } 73000$$

40. 3

40. Average salary

$$= \frac{3 \times 540000 + 5 \times 120000 + 4 \times 60000}{3 + 5 + 12}$$

$$= 2,05,000$$

41. Data Insufficient

42. Data Insufficient

43. Data Insufficient

44. 3

44. Number of students

$$= 31 + 19 + 27 + 10 + 15 + 10 + 17 + 21 + 17 + 12$$

$$= 179$$

45. 2

45. Dance

46. 2

46. Fine arts

47. 4

47. Dramatics = $19 - 17 = 2$

48. 2

48. Dance = $31 - 10 = 21$

49. 4

49. On earth,

Land : Water or Land : Water
 (1 : 2) x 10 10 : 20

In another hemisphere

Land : Water
 (2 : 3) x 3

Land : Water
6 : 9

So, the southern hemisphere
Land : Water
10 - 6 : 20 - 9
4 : 11

50. 2
50. The required number = LCM of (9, 10, 15) x + 8
LCM of 9, 10, 15 = 90
The number = 90x + 8
Now, 4x = 21
90 x 21 + 8
1890 + 8 = 1898
So, number 1936 – 1898 = 38
So, 2nd option.

51. 3
51. 30% of x = y y% of x = ?
 $\left(\frac{30}{100}\right)x = y \Rightarrow \frac{y}{100} \times 40$
 $\Rightarrow \left(\frac{30}{100}\right)x \left(\frac{40}{100}\right) \Rightarrow \frac{12}{100}(x)$
 $\Rightarrow 12\% \text{ of } x$

51. 3
51. 30% of x = y y% of x = ?
 $\left(\frac{30}{100}\right)x = y \Rightarrow \frac{y}{100} \times 40$
 $\Rightarrow \left(\frac{30}{100}\right)x \left(\frac{40}{100}\right) \Rightarrow \frac{12}{100}(x)$
 $\Rightarrow 12\% \text{ of } x$

52. 2
52. Trains are running in opposite directions:
Relative speed = (40 + 32) km/h

Distance = (600 + 400) m

$$1 \text{ km / h} = \frac{5}{18} \text{ m / sec}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{1000}{72 \times \frac{5}{18}} = 50 \text{ sec.}$$

53. 4
53. $x^2 + \frac{1}{x^2} = 51$
 $x^2 + \frac{1}{x^2} - 2 = 49$
 $x - \frac{1}{x} = 7$

$$x^3 + \frac{1}{x^3} = \left(x - \frac{1}{x}\right)^3 + 3\left(x - \frac{1}{x}\right)$$

$$= (7)^3 + 3(7) = 364$$

54. 1

54. $x = 3 + 2\sqrt{2}$ $y = 5 - 2\sqrt{6}$ \rightarrow $(2)(\sqrt{2})(\sqrt{3})$

$$\sqrt{x} = \sqrt{2+1+2\sqrt{2}} \quad \sqrt{y} = \sqrt{(\sqrt{3}-\sqrt{2})^2}$$

$$\sqrt{x} = \sqrt{(\sqrt{2}+1)^2} \quad \sqrt{y} = \sqrt{3}-\sqrt{2}$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

$$\sqrt{x} = \sqrt{2} + 1$$

$$\sqrt{x} + \sqrt{y} = \sqrt{2} + 1 + \sqrt{3} - \sqrt{2}$$

$$= 1 + \sqrt{3}$$

55. 2

55. Required distance = $\frac{\text{Product of speed}}{\text{Difference of speed}} \times (\text{Difference between arrival time})$

$$= \frac{8 \times 12}{4} \times \frac{(6+6)}{60}$$

(Time should be in hours)
Speed should be in km/hr

$$= 4.8 \text{ km}$$

We can use this formula when there are two situations like this.

56. 2

56. 132, 104, 80, 48, 20

Difference \rightarrow 28 28

So, in place of **80**, there should be 76

132, 104, 76, 48, 20

to maintain the difference = 28

57. 3

57. 1, 3, 7, 15, 31, 65, 127

They are in the form of $2^1 - 1, 2^2 - 1, 2^3 - 1, 2^4 - 1, 2^5 - 1, 2^6 - 1, 2^7 - 1$

So, 65 is wrong, it should be 63

58. 1

58. 6, (30), 60, 120, 210

24 should be there

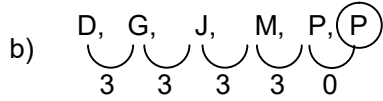
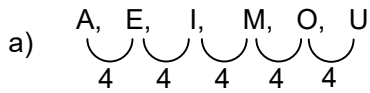
6, 24, 60, 120, 210

18, 36, 60, 90

18, 24, 30

Difference of difference is making a pattern

59. 2
 59. AD, EG, IJ, MM, QP, UP

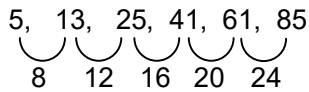


So, P is wrong
 Difference is not maintained

However, UP is wrong
 It should be US

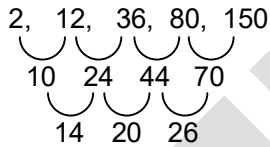
60. 1
 60. 5, 13, 25, 40, 61, 85

40 is wrong and 41 should be there to maintain



61. 4
 61. 2, 12, 30, 80, 150

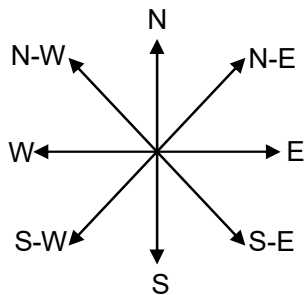
30 is wrong, It should be 36 to maintain the



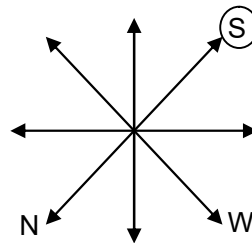
62. 3
 62. 0, 4, 18, 45, 100

0×1^2
 1×2^2
 2×3^2
 $3 \times 4^2 \rightarrow 48$
 45 is wrong.

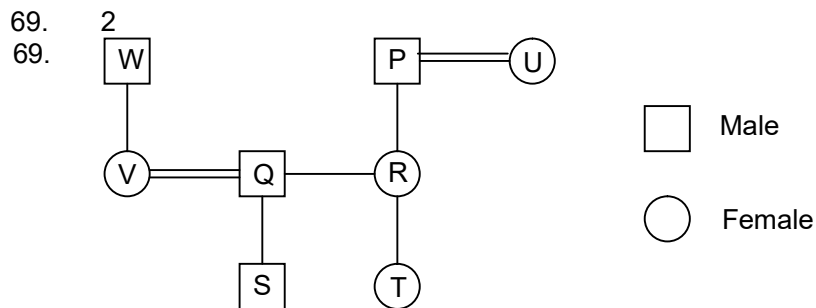
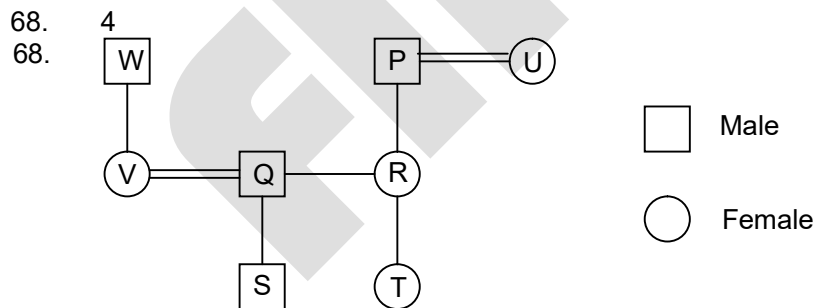
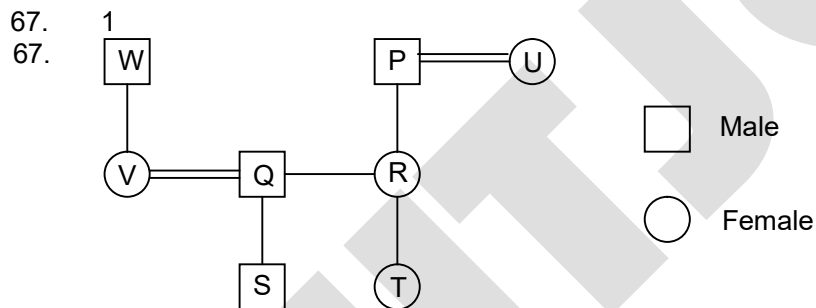
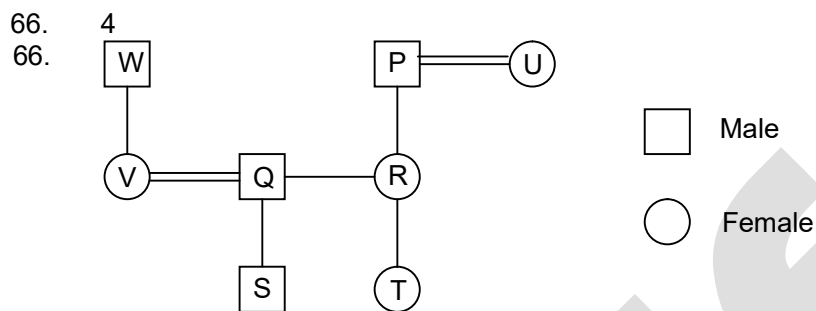
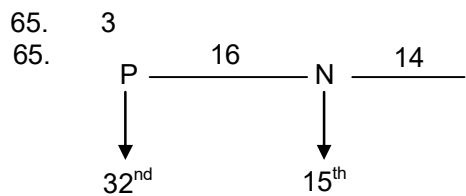
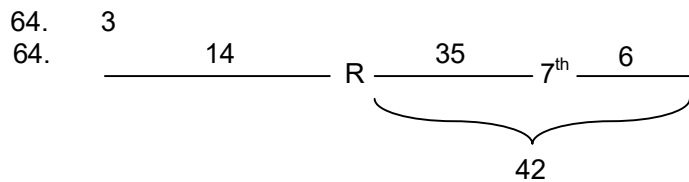
63. 2
 63.



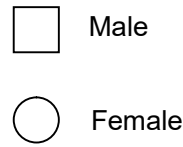
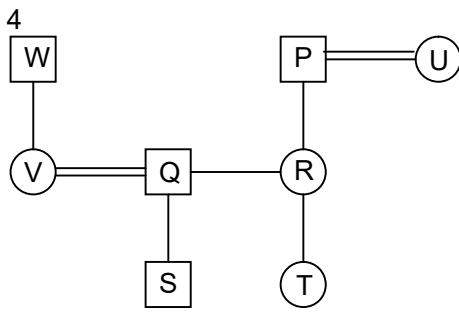
Original direction



According to question



70.
70.



71.
71.

1
 $(42 \div 6) - (15 \div 3) = 2$
 $(36 \div 9) - (9 \div 3) = 1$
 $(38 \div 19) - (20 \div 10) = 0$

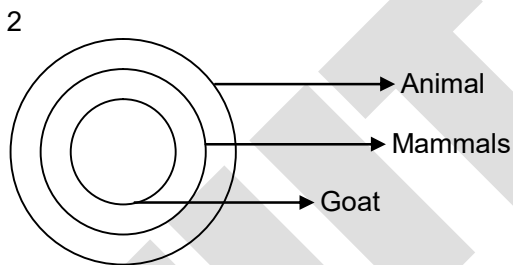
72.
72.

2
 $3 \times 2 + 2 = 8$
 $7 \times 5 + 5 = 40$
 Similarly, $9 \times 8 + 8 = 80$
 So, the missing number is 9.

73.
73.

1
 $40 - 10 + 5 \div 4 \times 5 = 21$
 $40 \div 10 \times 5 - 4 + 5$
 $20 - 4 + 5 = 21$

74.
74.



75.
75.

3
 14.40 11.40
 \ /
 12.60
 / \
 $(12.60 - 11.40)$ $(14.40 - 16.60)$
 1.20 : 1.80
 2:3

76. 2
 $\sqrt{4} + \sqrt{9} = 2 + 3 = (5)^2 = 25$
 $\sqrt{4} + \sqrt{25} = 2 + 5 = (7)^2 = 49$
 $\sqrt{9} + \sqrt{36} = 3 + 6 = (9)^2 = \boxed{81}$

77. 1
 $(4 \times 6) - (1 + 2) = 21$
 $(12 \times 5) - (3 + 4) = 53$
 $(7 \times 13) - (5 + 11) = \boxed{75}$

78. 1
 78. Persons take tea and lassi but not coffee is 18.

79. 3
 79. Persons take tea and coffee but not lassi is 8.

80. 4
 80. Persons take lassi is $19 + 18 + 14 + 28 + 35 = 114$

81. 2
 81. Persons take only coffee is $23 + 20 = 43$

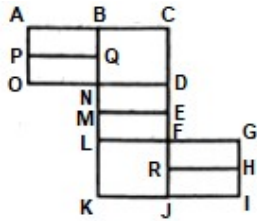
82. 2
 82. Persons take all the three is 14.

83. 3
 $\sqrt{10 + \sqrt{x + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}} = 4$
 $\sqrt{10 + \sqrt{x + \sqrt{108 + \sqrt{154 + 15}}} = 4$
 $\sqrt{10 + \sqrt{x + \sqrt{108 + \sqrt{169}}} = 4$
 $\sqrt{10 + \sqrt{x + \sqrt{108 + 13}}} = 4$
 $\sqrt{10 + \sqrt{x + \sqrt{121}}} = 4$
 $\sqrt{10 + \sqrt{x + 11}} = 4$
 $10 + \sqrt{x + 11} = 16$
 $\sqrt{x + 11} = 16 - 10$
 $\sqrt{x + 11} = 6$
 $x + 11 = 36$
 $x = 36 - 11$
 $x = 25$

84. 3
 84. -3 series

D I V I N E	Similarly,	P O W E R F U L
$\begin{array}{cccccc} -3 \downarrow & -3 \downarrow & -3 \downarrow & -3 \downarrow & -3 \downarrow & -3 \downarrow \\ A & F & S & F & K & B \end{array}$		$\begin{array}{cccccc} -3 \downarrow & -3 \downarrow & -3 \downarrow & -3 \downarrow & -3 \downarrow & -3 \downarrow & -3 \downarrow & -3 \downarrow \\ M & L & T & B & O & C & R & I \end{array}$

85. 3.
85. As per observation
86. 4
86. As per observation
87. 2.
87. As per observation
88. 4
88. As per observation
89. 1
89. $5 \times 2 + 2 = 12$
 $12 \times 2 + 2 = 26$
 $26 \times 2 + 2 = \mathbf{54}$
 $54 \times 2 + 2 = 110$
 $110 \times 2 + 2 = 222$
90. 4
90. $(4 - 2) \times 3 = 6$
 $(16 - 4) \times 3 = 36$
 $(8 - 2) \times 3 = \mathbf{18}$
91. 2
91. $(30 - 12) \times 3 = 54$
 $(30 - 13) \times 3 = 51$
 $(27 - 12) \times 3 = 45$
 $(27 - 13) \times 3 = \mathbf{42}$
92. 3
92. $(2)^2 + (4)^2 = 20$
 $(3)^2 + (9)^2 = 90$
 $(1)^2 + (7)^2 = \mathbf{50}$
93. 2
93. $(5 \times 6) - (3 \times 8) = 6$
 $(10 \times 4) - (2 \times 7) = 26$
 $(9 \times 7) - (6 \times 8) = 15$
94. 2
94. In second and third dice two numbers are common (3 and 5). So remaining numbers are opposite to each other means 4 and 6 are opposite.
95. 2
95. The figure may be labeled as shown



The simplest rectangles are ABQP, PQNO, BCDN, NDEM, MEFL, LFJK, FGHR, and RHIJ i.e. 8 in number.

The rectangles composed of two components each are ABNO, BCEM, NDFL, MEJK and FGIJ i.e. 5 in number.

The rectangles composed of three components each are ACDO, BCFL, NDJK and LGIK i.e. 4 in number.

There is only one rectangle i.e. BCJK composed of four components.

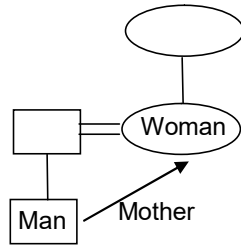
Total number of rectangles in the figure = 8 + 5 + 4 + 1 = 18.

96. 4

96. (a) Million, (d) Minimum, (b) Monarch, (c) Monk.

97. 2

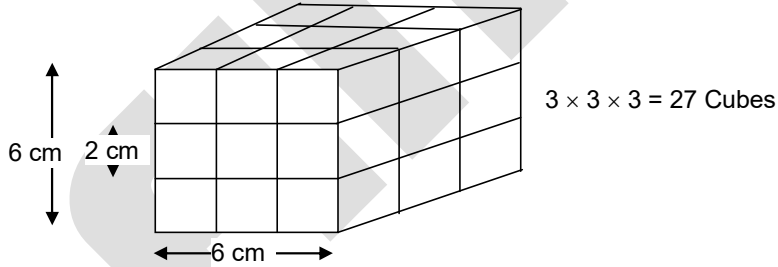
97.



My father's mother-in-law means maternal grand mother and only daughter of maternal grand mother means mother.

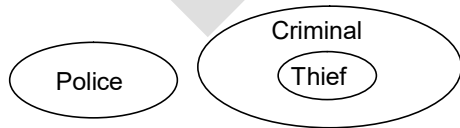
98. 3

98.



99. 1

99.



100. 2

100.

