

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

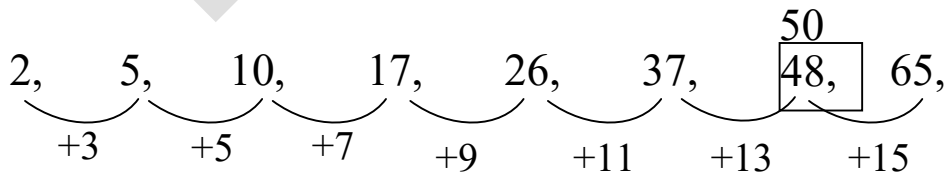
13. 4
 13. $\frac{1026}{1805} = \frac{1026 \div 19}{1805 \div 19} = \frac{54}{95}$

14. 3

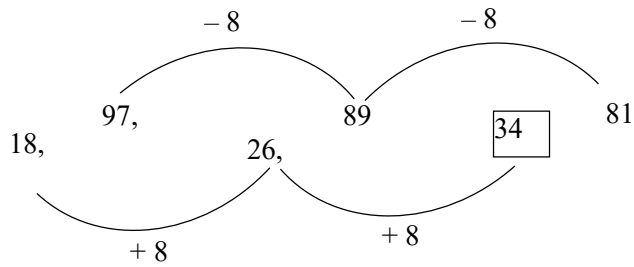
	Initial	New
Price	x	$\frac{130x}{100} = \frac{13x}{10}$
Visitors	y	$\frac{80y}{100} = \frac{4y}{5}$
Revenue	xy	$\frac{52xy}{50} = \frac{104xy}{100}$

Clearly revenue will increase by 4%

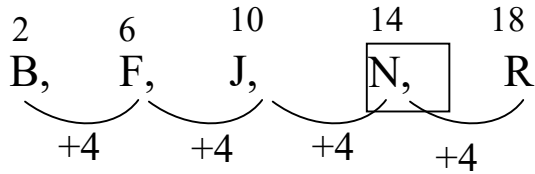
15. 3
 15.



16. 2
16.



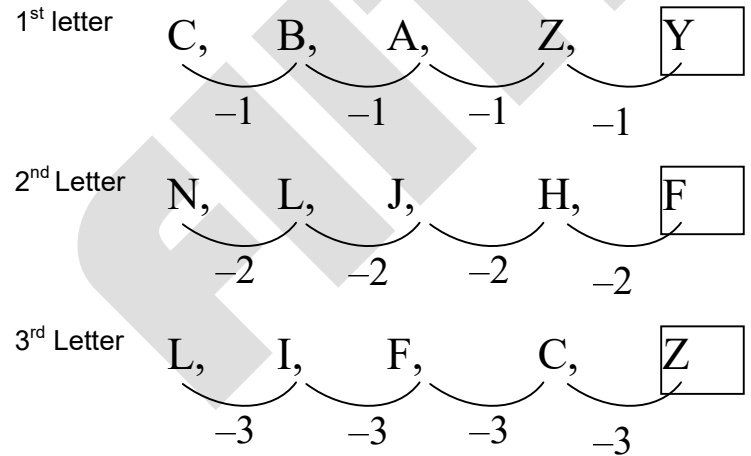
17. 1
17.



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 = $\left(60 \times \frac{5}{18}\right) \times 9 = 150$ 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'
 \Rightarrow 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 $\rightarrow P(\text{vowel}) = 4/11$

27. 3

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

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

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

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

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

$$x = 24$$

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

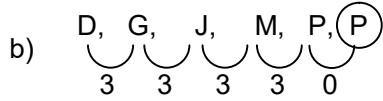
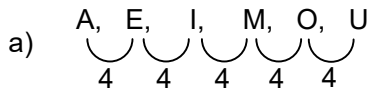
58. 6, (30), 60, 120, 210

24 should be there

6, 24, 60, 120, 210

Difference of difference is making a pattern

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

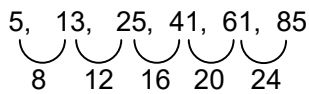


So, P is wrong
 Difference is not maintained

However, UP is wrong
 It should be US

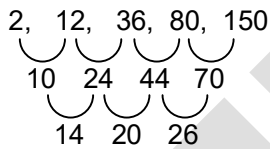
60. 1
 60. 5, 13, 25, 40, 61, 85

40 is wrong and 41 should be there to maintain



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

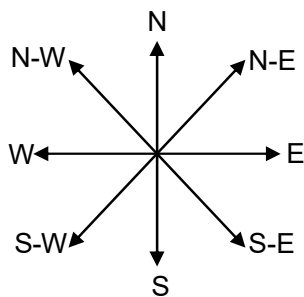
30 is wrong, It should be 36 to maintain the



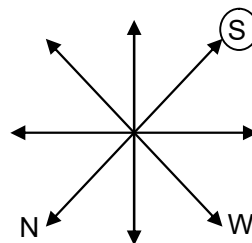
62. 3
 62. 0, 4, 18, 45, 100

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

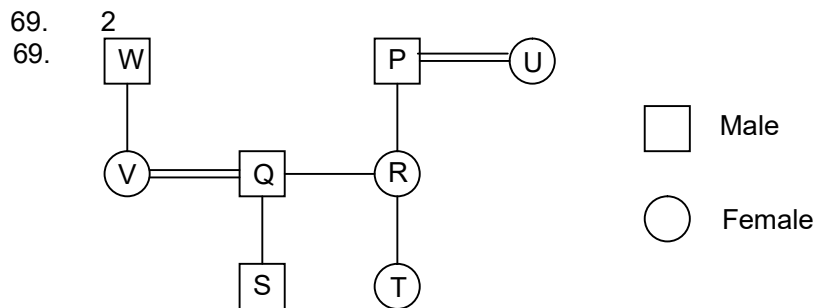
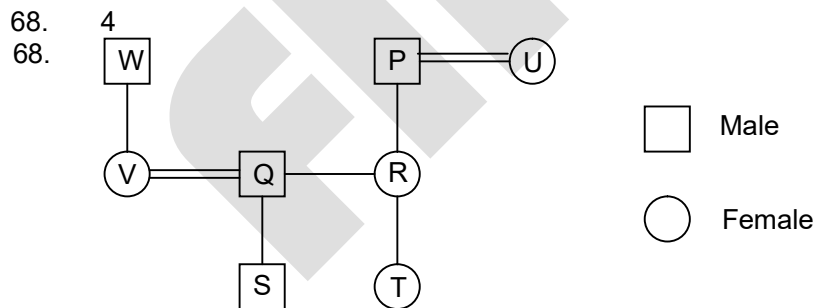
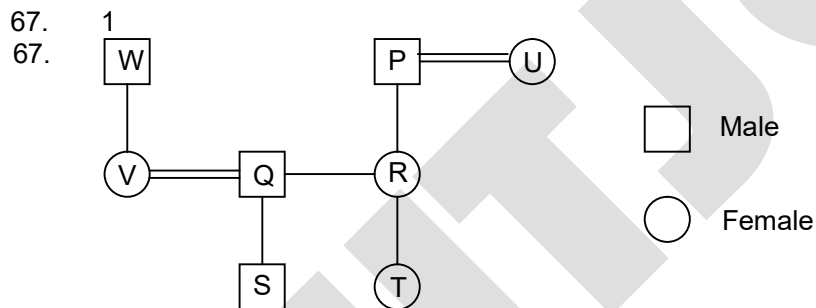
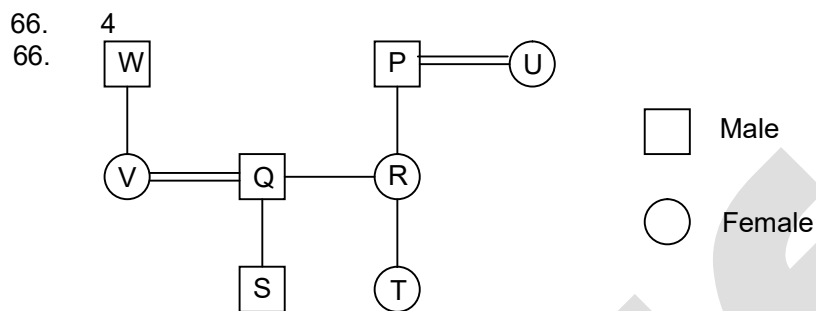
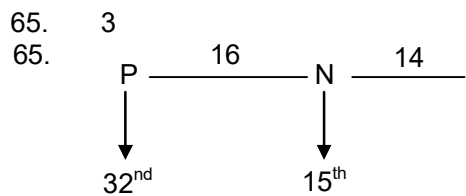
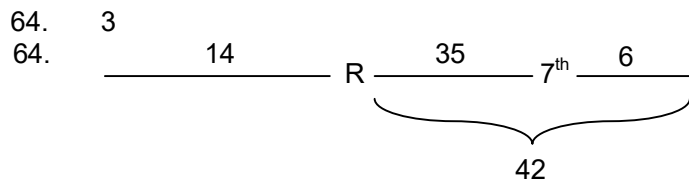
63. 2
 63.



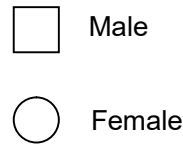
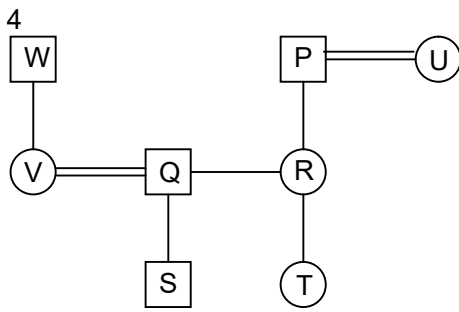
Original direction



According to question



70.
70.



71.
71.

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

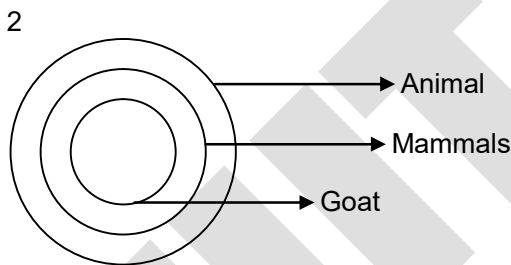
72.
72.

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 $23 + 20 = 43$

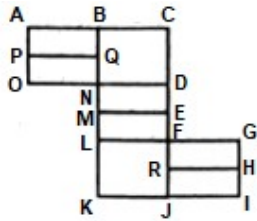
82. 2
 82. Persons take all the three is 14.

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
$\begin{array}{cccccc} -3 & & -3 & & -3 & & -3 & & -3 \\ \downarrow & & \downarrow & & \downarrow & & \downarrow & & \downarrow \\ A & F & S & F & K & B & & & \end{array}$		$\begin{array}{cccccc} -3 & & -3 & & -3 & & -3 & & -3 \\ \downarrow & & \downarrow & & \downarrow & & \downarrow & & \downarrow \\ M & L & T & B & O & C & R & I & \end{array}$

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.

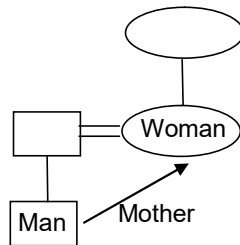
Total number of rectangles in the figure = 8 + 5 + 4 + 1 = 18.

96. 4

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

97. 2

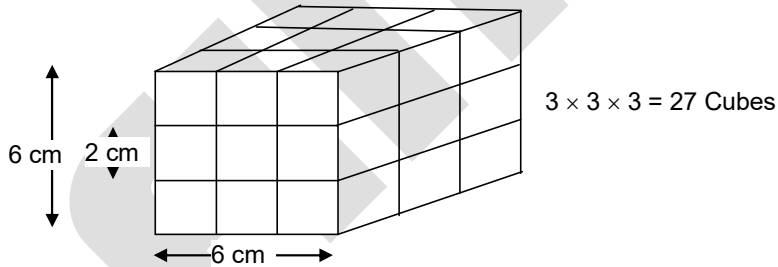
97.



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

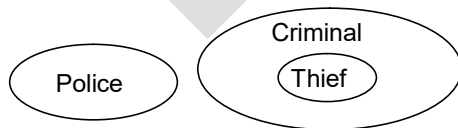
98. 3

98.



99. 1

99.



100. 2

100.

