STATE TALENT SEARCH EXAMINATION-2017
MENTAL ABILITY TEST (MAT) HINTS & SOLUTIONS

1. Sol. (2)

$60 < 3 > 4 \diamondsuit 9$

$60 + 3 \times 4 - 9$

$60 + 12 - 9 \Rightarrow 63$

2. Sol. (1)

$9^2 + 6^2 = 117$ and $9 - 6 = 3$

$8^2 + 3^2 = 73$ and $8 - 3 = 5$

So $6^2 + 4^2 = 52$ and $6 - 4 = 2$

So answer is 6

3. Sol. (3)

$\frac{6}{13}, \frac{13}{38}, ?, \frac{27}{338}, \frac{34}{1013}$ (+7 +7 +7 +7)

$13 \times 3 - 1 \Rightarrow 38$

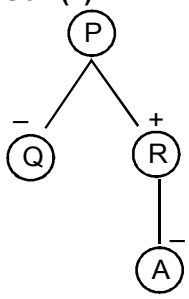
$38 \times 3 - 1 \Rightarrow 113$

$113 \times 3 - 1 \Rightarrow 338$

$338 \times 3 - 1 \Rightarrow 1013$

So $\frac{20}{113}$

4. Sol. (2)



So Q is father's sister of A.

5. Sol. (4)

$4 + 33 - 3 \times 4 \div 5$

Substitute $4 \times 33 \div 3 - 4 + 5 \Rightarrow 45$

6. Sol. (3)

If $27^{th} \rightarrow$ Wednesday.

So 6,13,20,27 $\rightarrow$ Wednesday

So 3^{rd} day $\rightarrow$ Sunday

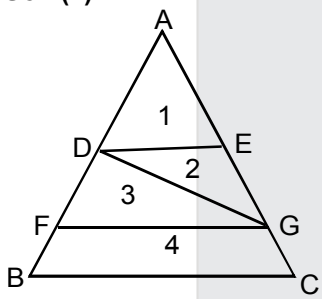
7. Sol. (3)

Father Son
6x x (Present Age)
After one year (6x + 1) = 5(x+1)
6x + 1 = 5x + 5
X = 4
So present age of father = 24 years.

8. Sol. (1)

AGEOURENC (Newly framed word)
So 8th from left in N

9. Sol. (2)



Triangle are 1,2,3, (1+2), (1+2+3), (1+2+3+4)
So total 6 triangles.

10. Sol. (4)

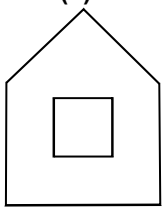
A C F J	O Q T X	D F I M	J L N Q
1 3 6 10	15 17 20 24	4 6 9 13	10 12 14 17

Difference of consecutive alphabet in first three is 2,3,4 but NOT in JLNQ

11. Sol. (1)

Firstly man was facing west, after 45º clockwise turn he was facing north – west and then after taking 135º Anticlockwise turn he was facing south.

12. Sol. (4)



In this 4- sided polygon inside 5- sided polygon.
In other figures inner polygon has 1-side more than outer polygon.

13. Sol. (3)

Total students = Ramesh place from LHS + Ramesh place from RHS – 1
So 8 + 8 –1 = 15

14. Sol. (2)

This is question of direct coding
N $\rightarrow$ 1
E $\rightarrow$ 7
D $\rightarrow$ 9
L $\rightarrow$ 3
NEEDLE $\rightarrow$ 177937

15. Sol. (2)
Exactly one Profession = 15 + 16 + 12 $\Rightarrow$ 43

16. Sol. (4)
Exactly two Profession = 10 + 20 $\Rightarrow$ 30

17. Sol. (3)
PULSE : LSUIP
Here (I) and (E) is different Alphabet.

18. Sol. (1)
Take (6) pearl randomly
Weigh (3) + (3)
Case (1) If equal then between Remaining two we can find odd one
Case (2) If unequal then one of them (between 3 and 3) is heavy so In next one weighing we can find odd one among 3

19. Sol. (4)

$$\frac{7}{8}+\frac{18}{216}+\frac{37}{1728}+.....+\frac{271}{729000}$$

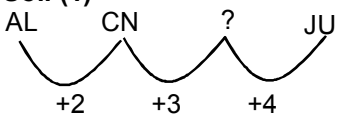
$$\frac{7}{1^3\times 2^3}+\frac{19}{2^3\times 3^3}+\frac{37}{3^3\times 4^3}+.....\frac{271}{9^3\times 10^3}$$

$$\frac{1}{1^3}-\frac{1}{2^3}+\frac{1}{2^3}-\frac{1}{3^3}+.....\frac{1}{9^3}-\frac{1}{10^3}$$

$$1-\frac{1}{10^3}\Rightarrow\frac{999}{1000}=0.999$$

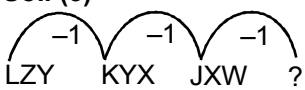
20. Sol. (2)
2, 10, 15, 45, 180, ?
2 × 5 = 10
10 × 4.5 = 45
45 × 4 = 180
180 × 3.5 = 630

21. Sol. (1)



So FQ

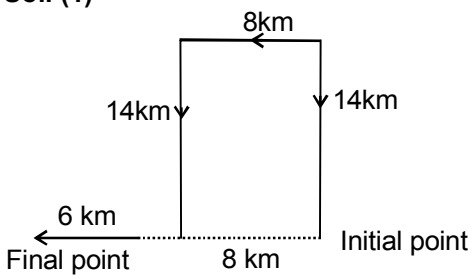
22. Sol. (3)



So IWV

23. Sol. (4)
B C F G H K L M P
2 3 6 7 8 11 12 13 16
So 17 18 21 $\rightarrow$ Q R U

24. Sol. (1)



So 6 + 8 = 14 km

25. Sol. (2)
(1+ 2), (3+4), (5+6), (1+3), (3+5), (2+4), (4+6), (1+2+3+4), (3+4+5+6) So total = 9

26. Sol. (3) The square of first & last digit is being written in reverse order.

27. Sol. (1)

28. Sol. (4)

29. Sol. (3)

30. Sol. (1) lines & dots are increasing by 1.

31. Sol. (2) Given $n^2 = 25^{16} \times 16^8 = 5^{32} \times 2^{32} = (10)^{32} \Rightarrow n = 10^{16}$ so digital sum of the number will be 1.

32. Sol. (2) Given numbers can be written as
$2^0, 2^{1/2}, 2^{2/3}, 2^{3/8}$, since the base is positive & greater than 1 so largest exponent will result largest no. so Ans. $2^{2/3} \Rightarrow 4^{1/3}$

33. Sol. (4) The difference of vertical line no's is placed on first position, horizontal line no's difference is placed on last position, diagonal line no's difference is placed on middle position so according to this answer will be 3,9.

34. Sol. (3) Interchange of +, ÷ will make the equation correct.

35. Sol. (4) a b c a b c a b c a b c.

36. Sol. (1) 8 × 7 = 20, To get the result if we subtract each no. in LHS by 3 & then multiply we get the result same as RHS. So applying the same logic in 15 × 3 = (15 –3) (3 – 3) = 12 × 0 = 0 Ans.

37. Sol. (2)

38. Sol. (3)

39. Sol. (2)

40. Sol. (4)

41. Sol. (3) Century year will be leap year iff it is divisible by 400. 1800 is not divisible by 400 so it will not be a leap year.

42. Sol. (1)

43. Sol. (2) No surface painted cubes will be $(n-2)^3 \Rightarrow (6-2)^3 \Rightarrow 64$

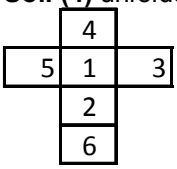
44. Sol. (4)

45. Sol. (1) First day & last day of a non leap year is always same.

46. Sol. (3)

	Digits required
1 – 9	9
10 – 95	172
So total =	181

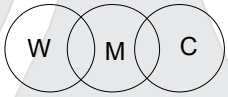
47. Sol. (4) unfolded view of given die will be



So required sum = 9

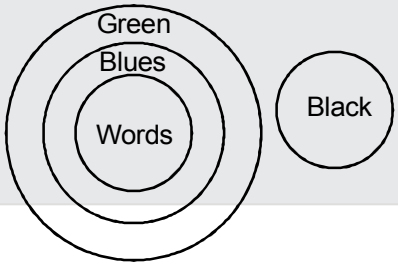
48. Sol. (1) $5^9 = (4 + 1)^9$, by the rule of expansion we can say that when this expression will be divided by 4, remainder will be 1.

49. Sol. (4) The only possible diagram which follows the given statements will be.



According to this fig. neither conclusion I nor II is true.

50. Sol. (3) The only possible diagram which follows the given statements will be.



According to this figure both conclusion I & II are true.