


MAHARASHTRA  
NATIONAL TALENT SEARCH EXAMINATION, 2019-20  
STAGE-01  
MENTAL ABILITY (MAT)

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**SOLUTIONS**

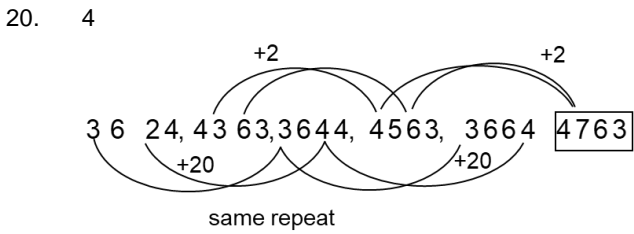
1. 1  
Sum of digits are multiple of 3.
2. 1  
 $5^3 + 7 = 132$ ,  $9^3 + 7 = 736$ ,  $7^3 + 7 = 350$   
 $\therefore 6^3 + 7 = 223$
3. 2  
Sum of digits = 13 ( $1+9+3=13$ ,  $4+5+4=13$ ,  $4+5+4=13$ ,  $2+6+5=13$ )
4. 4  
Alternate letter has difference of 2, except 4(AWCZ)
5. 3 →  
sum of all letter position is multiple of 3.
6. 4  
Save → EVAS
7. Bonus all fig. are incorrect order.
8. 3  
By observation  → reverse order in option 3
9. Bonus [all fig. are possible]
10. 1  
The sum of the digits of the no. in each pair is the same  
 $1+1+5+2+9=10$ ,  $7+2+1+3+5=18$   
Similarly,  $1+5+2+9+4+3=24$ ,  $2+1+3+5+4+9=24$
11. 2  
Opposite element = "-" so it cannot be adjacent to it".
12. 3  
< is opposite of D
13. 4  
Opposite elements cannot be adjacent.
14. 3  
Outer element comes inside.
15. Bonus 1, 2, 3, are same option

16. 3  
Analogical figure.

17. 4  
 $4 \times 2 - 2 = 6, 6 \times 3 - 2 = 16, 16 \times 4 - 2 = 62, 62 \times 5 = 310, -2 = 308, 308 \times 6 - 2 = 1846$

18. 3  
Alternate series of +12, +24, +48

19. 1  
+6, +12, +18, +24, +30



21. 1

22. 4

23. 4

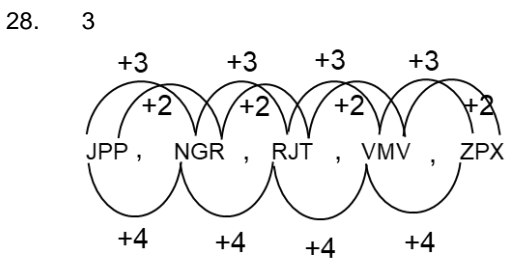
ATUL	TUSHAR	AMAR	NISHANT
CRICKET	CRICKET	CRICKET	⊗
FOOTBALL	FOOTBALL	FOOTBALL	⊗
⊗	KABBADI	KABBADI	KABBADI
⊗	⊗	KHO-KHO	KHO-KHO

24. 3  
abc | bca | cab | abc

25. 2  
abba | baab | abba | baab

26. 3  
By observation

27. 2  
By observation



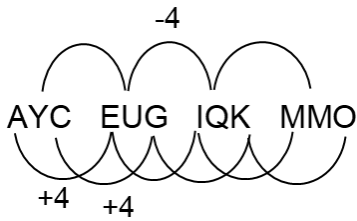
29. 2  
 $J_{1610}P$  J = 10, P = 16



30. 1  
Addition of place of letter

$$\therefore 29 = A + Y + C = 1 + 25 + 3$$

$$\therefore MMO = 13 + 13 + 15, MMO = 41$$



31. 4  
Needs to check initial 2 terms are matching.

32. 4

33. 2

34. 4

35. 1  
By putting the value.

36. 2  
By putting the value.

37. 3.

38. 2  
[Substituting value at the place of symbol and after mathematical operation again replacing value with symbol.]

39. 2  
Continuous sequence.

40. 3  
By observation

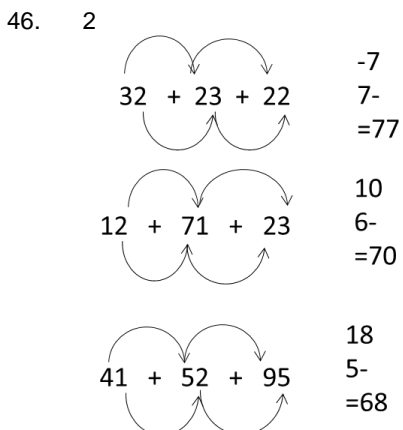
41. 2  
10 is common in all four.

42. 4  
32 only in ACTING.

43. 2  
 $97 = 21 + 14 + 12 + 15 + 35$

44. 2  
By observation

45. 4  
By observation



47. 4

$$\begin{aligned} &8 \times 9 + 7 \times 5 \\ &72 + 35 \\ &= 107 \times 2 = 214 \\ &7 \times 3 + 6 \times 4 \\ &= 21 + 24 \\ &= 45 \times 2 \\ &= 90 \\ &3 \times 6 + 4 \times 9 \\ &18 + 36 \\ &= 54 \times 2 \\ &= 108 \end{aligned}$$

48. 3  
 $98 - 64 = 34 \Rightarrow$  By pattern given in question.

49. 4  
 $7 + 4 = 11 \rightarrow 11^2 = 121$   
By pattern given in question.

50. 2  
 $45 + 81 = 126$   
By pattern given in question.

51. 2

52. 4

53. 2  
K M F : L L H :: R M S :  
1113 6 1212 8 1813 19  
 $\begin{array}{ccc|ccc} |_{+1} & |_{-1} & |_{+2} & & & & \\ 12128 & & & 191221 & & & \\ & & & S L U & & & \end{array}$

54. 2  
ADE : F G J : K N O : P Q T  
1 4 5 6 7 10 11 14 15 16 17 20  
PQT

55. 4  
2 : A L K L O :: W O U L D :: T L R I A  
 $\begin{array}{cccccccccc} 1 & 12 & 11 & 12 & 15 & 23 & 15 & 21 & 12 & 4 & 20 & 12 & 18 & 9 & 1 \\ & & & +3 & & & & & & & & & & & +3 \end{array}$   
4 15 14 15 18  
D O N O R

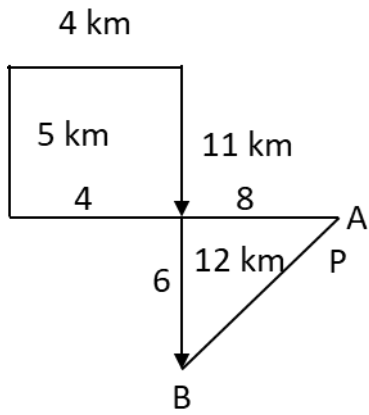
56. 1  
4, 9 (5)<sup>2</sup> 5  
 $\begin{array}{ccc} F & J & 25 & 16 & NS \Rightarrow (F-J)^2 = 16 \\ 6 & 10 & & & \end{array}$   
 $\begin{array}{ccc} L & Z & 25 & 196 & SX \\ 12 & 16 & & & \end{array}$   
NQ ? ? W%  $\Rightarrow N-Q$   
 $(N-Q)^2 = (14-17)^2 = 9$   
 $(W-Y)^2 = (23-25)^2 = 4$   
NQ 4 9 W%

57. 3  
 $\begin{array}{ccc} 1 & A & M(13) & Q17 \\ 1+2 & & 1+8 & \\ 3 & C & Li(21) & E 5(31) |_{+14} \\ & & 1+10 & \\ 1+4 & G & E5(31) & (47)(21) = U \end{array}$

58. 2

59. 3

60. 3  
North



61. 4

$$OA = (12 - 4) = 8 \text{ km}$$

$$OB = (11 - 5) = 6 \text{ km}$$

$$AB = (8)^2 + (6)^2 = 100 = 10 \text{ km}$$

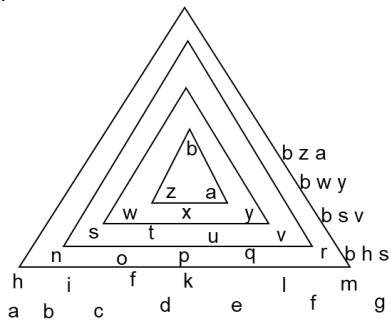
62. 1

hab : mgf :: jicd : ?

Ranking of respective letter from left side is equal to ranking of letter from right.

jicd : kled

63. 1



bza : bwy :: bsv : bnr

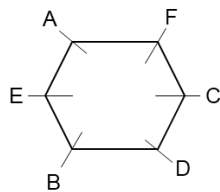
64. 2

wsop : yvqp : ptw :

Ranking of letter from left side is equal to ranking of letter from right.

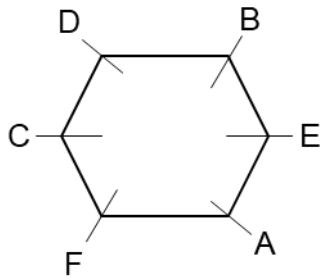
ptw = puy p

65 – 67

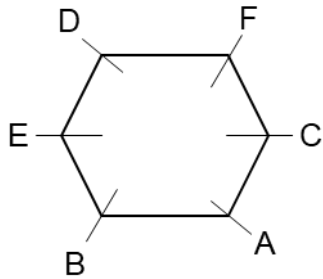


65. 1 (A)

66. 4(C)



67. 1(A)



68. 2

69. 1

70 – 71

SOL. Ten years ago, the ratio of ages of sunil and anil was 1 : 7.

Let their ages would be  $x$  &  $7x$ .

So, present age of Sunil and Anil are  $(x+10)$  &  $(7x+10)$

Ten years hence, the ratio of their ages will be 1 : 2.

So,

$$\frac{x+20}{7x+20} = \frac{1}{2}$$

$$2x+40 = 7x+20$$

$$20 = 5x$$

$$x = 4$$

70. 1

Sunil's present age  $x+10 = 4+10 = 14$  years

71. 2 Ten years before Anil's age =  $7x = 7 \times 4 = 28$ .

(2) 28 years

72. - 73

AMRUTA (11) ↓

SUNEETA (26) ↑

Total 60.

Amrita is 11th from front.

Suneeta is at 26th place from behind, so

Suneeta is  $60+1-26 = 35$ th from front.

Sapna is at central place between Amrita & Suneeta.

72. Sapna is at  $\frac{11+35}{2} = \frac{46}{2} = 23$ th from front.

Ans (3) 23

73. Sapna's is ranking from behind =  $60+1-23 = 38$

Ans(2) 38

74. Ans (2)

75. Ans (3)

76. 4  
 17 (68) 28  
 11 (22) 14  
 49 9  
 Sol  $\frac{17 \times 28}{7} = 68$   
 $\frac{11 \times 14}{7} = 22$   
 $\frac{49 \times 9}{7} = 63$

77. 3  
 24(7)67  
 53(6)25  
 82 35  
 $\frac{24+67}{13} = \frac{91}{13} = 7$   
 $\frac{53+25}{13} = \frac{78}{13} = 6$   
 $\frac{82+35}{13} = \frac{117}{13} = 9$   
 Ans.(3)9

78 TO 80

78. 2  
 AUEFG EOVWX IAPQR  
 Sol. First two letters are vowel and next three letters are consecutive

So, Ans 2 UEJKL which have same property.

79. 3  
 XZAVT WUESQ TRUPN  
 26 24 20 20 23 21 19 17 20 18 16 17  
 2 2 2 2 2 2  
 First two letter have difference of 2 and same as last two letters & middle one is vowel.  
 So, Ans LJOHF

80. 2  
 BYMN DWJZ GTKP  
 All letters are consonants  
 So, Ans (2) CXHS

81 – 83

ACTIVE = 91) CEVKXG

A C T I V E = (1) C E V K X G

13 20 9 22 5  $\xrightarrow{+2}$  3 5 22 11 24 7

A C T I V E = (2) E F V K Y I

1 3 20 9 22 5 5 6 22 11 25 9

$\xrightarrow{+4+3+2+2+3+4}$   
 A C T I V E = (3) X Z Q F S B

$\xrightarrow{-3/+23}$   
 1 3 20 1 22 5 24 26 17 6 19 2

$\xrightarrow{2+3+4+5+6+7}$

81. 2  
 GOLDEN = KRNFHR  
 7 15 12 4 5 14 11 18 14 6 8 18

$\xrightarrow{+4+3+2+2+3+4}$

82. 3

ORANGE = LOXKDB

151311475 1215241142

$\xrightarrow{-3/+23}$

83. 1

PURPLE = RWTRNG

1621181612518232918147

$\xrightarrow{+2}$

(1)

84. 1


85. 2

86 - 87

 -3

 -4

 -6

 -2

 -9

 -1

 -8

 -5

 -7

86. 3 (2356)

87. 4

88. 3

Letter : A T M G O D N R S

Digits: 9 8 7 6 5 4 3 2 1

Donar = 4 5 3 9 2

Ans .3

89. 3

90. 1

91.

$$88 - 7 = 39 \Rightarrow 88 - (7)^2 = 88 - 49 = 39$$

$$77 - 6 = 41 \Rightarrow 77 - (6)^2 = 77 - 36 = 41$$

$$99 - 25 = 74 \Rightarrow 99 - (5)^2 = 99 - 25 = 74$$

$$\text{So, } 55 - 4 \Rightarrow 55 - (4)^2 = 55 - 16 = 39$$

Ans(2)39



92.

$$8 + 6 = 42 \Rightarrow 8 \times 6 - 6 = 42$$

$$7 + 5 = 30 \Rightarrow 7 \times 5 - 5 = 30$$

$$9 + 3 = 24 \Rightarrow 9 \times 3 - 3 = 24$$

So,

$$6 + 4 = 24 - 4 = 20$$

Ans(2)20

93 – 95

93. 2

94. 3

Sol. Total no. of cubes = 60

cubes have one face coloured = 24

cubes have no face coloured = 8

So, cubes have atleast two faces coloured

$$= 60 - (24 + 8)$$

$$= 60 - 32$$

$$= 28$$

95. 3

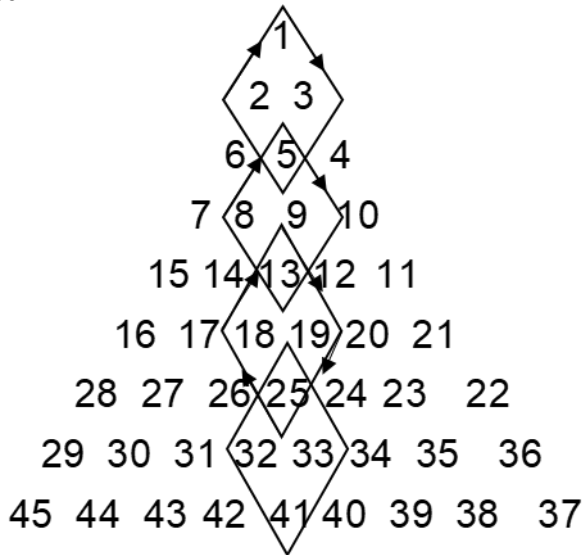
24

96 – 97

96. 2

97. 2

98 – 100



98. 1

$$1352 : 13\ 19\ 25\ 18 :: 5\ 9\ 13\ 8 :: 25\ 33\ 41\ 32$$

25334132

99. 163044 : 213538 :: 173143 : 203439

Sol. Rank of digit from left side is equal to rank of digit from right side.

Ans. (2) 20 39 39

100. 28 16 27 : 22 21 23 :: 29 28 30 : 36 22 35

Rank of digit from left side is equal to rank of digit from right side in a same line.