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## NATIONAL TALENT SEARCH EXAMINATION-2019-20, TELANGANA

### MEN TAL APTITUDE TEST (MAT) PAPER & HINTS & SOLUTION

**Directions:**

**Questions (1 to 5) :**

In the Number series given below, one Number is missing. Each series is followed by 4 alternatives (1), (2), (3), (4). One of them is the right answer. Identify and indicate it as per the "Instructions".

1. 6, 28, 120, 496, .....

(1) 1035

(2) 2016

(3) 2019

(4) 1234

**Sol. (2)**

$$6 \times 4 + 4 = 28$$

$$28 \times 4 + 8 = 120$$

$$120 \times 4 + 16 = 496$$

$$496 \times 4 + 32 = 1984 + 32 = 2016$$

2. 1, 5, 15, 34, 65, .....

(1) 111

(2) 76

(3) 87

(4) 104

**Sol. (1)**

Concept of difference of difference

1, 5, 15, 34, 65, ...  
+4, +10, +19, +31, ...  
+6, +9, +12, ...  
+3, +3, +3, ...  
46, 15  
111

$$65 + 46 = 111$$

3. 1, 43, 161, 407, ....

(1) 745

(2) 614

(3) 829

(4) 725

**Sol. (3)**

$$0^3 + 1^2 = 1$$

$$3^3 + 4^2 = 27 + 16 = 43$$

$$5^3 + 6^2 = 125 + 36 = 161$$

$$7^3 + 8^2 = 343 + 64 = 407$$

$$9^3 + 10^2 = 729 + 100 = 829$$

4. 7, 31, 211, 2311, .....  
 (1) 2 (2) 18641 (3) 20141 (4) 30031  
**Sol. (4)**

$$7 \times 5 - 4 = 31$$

$$31 \times 7 - 6 = 211$$

$$211 \times 11 - 10 = 2311$$

$$2311 \times 13 - 12 = 30031$$

5. 5, 23, 72, .....  
 (1) 181 (2) 175 (3) 96 (4) 124  
**Sol. (Bonus)**

### Directions

**Questions (6 to 10):** In each of the following Questions, a letter series is given in which some letters are missing. The missing letters are given in the proper sequence as one of the alternative. Find the correct alternative.

6. -- aba -- ba - ab  
 (1) abbba (2) abbab (3) baabb (4) bbaba  
**Sol. (2)**

-- a b a -- b a \_ a b

a b a | b a b | a b a | b a b

7. ab --- b - bbba -  
 (1) abaab (2) abbab (3) baaab (4) babba  
**Sol. (3)**

a b \_ \_ \_ b \_ b b a a \_

a b b | a a b | a b b | a a b

a b a b

8. - baa - aab - a - a  
 (1) aabb (2) aaba (3) abab (4) baab  
**Sol. (3)**

\_ b a a \_ a a b \_ a \_ a

a b | a a b | a a b | a a b | a

a b a b

9. -- babbbbaa - a --  
 (1) ababb (2) baaab (3) bbaba (4) babbb  
**Sol. (4)**

\_ \_ b a b b b a a \_ a \_ \_

b a b a | b b b a | a b a b b

10. - op- mo = n - pnmpop -  
 (1) mnpmon (2) mpnmpop (3) mnompn (4) mnpomn

Sol. (1)

\_o p \_ m o \_ n \_ p n m o p \_

m o p n | m o f n | m o p n | m o p n |

Directions:

Questions ( 11 to 15 ) : In the following alphabet series, a term is missing as shown by Question mark (?). Choose the missing term from options.

11. eac, gce, ieg, ?  
 (1) jhi (2) jgi (3) kgi (4) khi

Sol. (3)

Difference of place value of letters are =2 to next pair of letters.

First letters of each pairs.

Ex. e = 5, g = 7, i = 9, k = 11.

So answer is **kgi**.

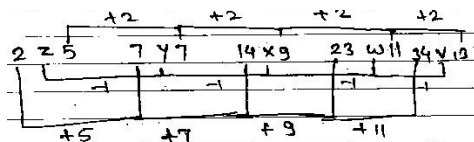
12. ejo, tyd, ins, xch, ?  
 (1) nrw (2) mrw (3) msx (4) nsx

Sol. (2)

Difference of adjacent letters is equal to 5 so answer is **mrw**.

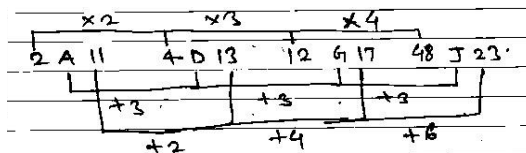
13. 2Z5, 7Y7, 14X9, 23W11, 34V13, ?  
 (1) 27U24 (2) 47U15 (3) 45U15 (4) 47U14

Sol. (2)



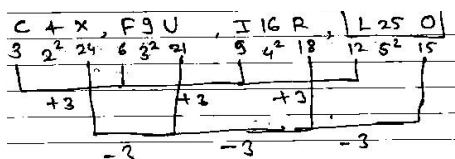
14. 2A11, 4D13, 12G17, ?  
 (1) 36I19 (2) 48J21 (3) 36J21 (4) 48J23

Sol. (4)



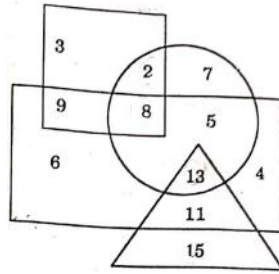
15. C4X, F9U, 116R, ?  
 (1) K25P (2) L25P (3) L25O (4) L27P

Sol. (3)



**Directions:**

**Questions (16 to 20) :** Observe the diagram carefully and then answer the following Questions. Here, **rectangle** represents males, **triangle** represents the people who did PhD, **circle** represents Urban and **square** represents civil servants.



16. How many urban male civil servants are there?

(1) 8

(2) 26

(3) 11

(4) 39

**Sol. (1)**

17. How many female PhD are there?

(1) 39

(2) 11

(3) 15

(4) 26

**Sol. (3)**

18. How many urban male PhD civil servants are there?

(1) 10

(2) 8

(3) 13

(4) None of these

**Sol. (4)**

19. How many urban female civil servants are there?

(1) 3

(2) 2

(3) 7

(4) 15

**Sol. (2)**

20. How many urban male PhD are there?

(1) 15

(2) 13

(3) 39

(4) None of these

**Sol. (2)**

**Directions:**

**Questions (21 to 25) :** In each of the following Questions, the two expressions on either side of sign (=) will have the same value. If two terms on either side or on the same side are interchanged, the correct terms to be interchanged have been given as one of the alternatives under the expressions. Find the correct alternative in each case.

21.  $5 + 3 \times 6 - 4 + 2 = 4 \times 3 - 10 \div 2 + 7$

(1) 4, 7

(2) 5, 7

(3) 6, 4

(4) 6, 10

**Sol. (3)**

22.  $7 \times 2 - 3 + 8 + 4 = 5 + 6 \times 2 - 24 + 3$

(1) 2, 6

(2) 6, 5

(3) 3, 24

(4) 7, 6

**Sol. (4)**

23.  $15 + 3 \times 4 - 8 \div 2 = 8 \times 5 + 16 \div 2 - 1$

(1) 3, 5

(2) 15, 5

(3) 15, 16

(4) 3, 1

**Sol. (1)**

25.  $8 \div 2 \times (-11) + 9 = 6 \times 2 - 5 + 4 \div 2$

(1) 5, 9

(2) 8, 5

(3) 9, 6

(4) 11, 5

**Sol. (Bonus)**

**Directions:**

**Questions (26 to 30) :** In this type of Question, a figure or a matrix is given in which some numbers are filled according to a rule. A place is left blank with Question mark. Find out which number will replace the Question mark (?) from given options.

26.



(1) 28

(2) 25

(3) 18

(4) 22

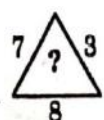
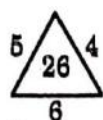
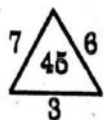
**Sol. (2)**

$$6 + 4 + 8 = 18 + 2 = 20$$

$$7 + 9 + 8 = 24 + 2 = 26$$

$$\therefore 5 + 6 + 12 = 23 + 2 = 25$$

27.



(1) 29

(2) 42

(3) 36

(4) 28

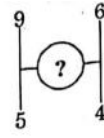
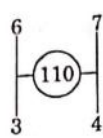
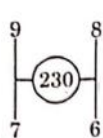
**Sol. (1)**

$$7 \times 6 + 3 = 45$$

$$5 \times 4 + 6 = 26$$

$$7 \times 3 + 8 = 21 + 8 = 29$$

28.



(1) 186

(2) 175

(3) 158

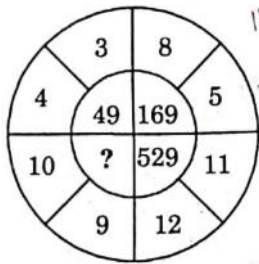
(4) 211

**Sol. (3)**

$$9^2 + 8^2 + 7^2 + 6^2 = 230$$

$$9^2 + 5^2 + 6^2 + 4^2 = 81 + 25 + 36 + 16 = 158$$

29.



Sol.

(1) 441

(2) 324

(3) 462

(4) 361

(4)

$$(3 + 4)^2 = 49$$

$$(10 + 9)^2 = 361$$

30.

9	17	16
5	4	8
5	4	?
9	17	8

Sol.

(1) 5

(2) 4

(3) 8

(4) 6

(2)

**Directions:**

**Questions (31 to 35) :** Arrange the words given below in a meaningful sequence and choose correct answer from the 4 options.

31. 1. Key, 2. Door, 3. Lock, 4. Room, 5. Switch on.

(1) 5, 1, 2, 4, 3

(2) 4, 2, 1, 5, 3

(3) 1, 3, 2, 4, 5

(4) 1, 2, 3, 5, 4

Sol.

(3)

32. 1. Word, 2. Paragraph, 3. Sentence, 4. Letters, 5. Phrase.

(1) 4, 1, 5, 2, 3

(2) 4, 1, 3, 5, 2

(3) 4, 2, 5, 1, 3

(4) 4, 1, 5, 3, 2

Sol.

(2)

33. 1. Police, 2. Punishment, 3. Crime, 4. Judge, 5. Judgement.

(1) 3, 1, 2, 4, 5

(2) 3, 1, 2, 5, 4

(3) 3, 1, 4, 2, 5

(4) 3, 1, 4, 5, 2

Sol.

(4)

34. 1. Family, 2. Community, 3. Member, 4. Locality, 5. Country.

(1) 3, 1, 2, 4, 5

(2) 3, 1, 2, 5, 4

(3) 3, 1, 4, 2, 5

(4) 3, 1, 4, 5, 2

Sol.

(3)

35. 1. Poverty, 2. Population, 3. Death, 4. Unemployment, 5. Disease.

(1) 2, 3, 4, 5, 1

(2) 3, 4, 2, 5, 1

(3) 2, 4, 1, 5, 3

(4) 1, 2, 3, 4, 5

Sol.

(3)

**Directions :**

**Questions (36 to 40) :** Find out the relationship between the first two words and choose the word from the given alternative, which bears the same relationship to the third word, as the first two bear.

36. Funk : Vitamins :: Curie : ?  
 (1) Uranium (2) Radium (3) Radioactivity (4) Photography  
**Sol. (3)**
37. Virology : Virus :: Semantics : ?  
 (1) Amoeba (2) Language (3) Nature (4) Society  
**Sol. (2)**
38. Pituitary : Brain :: Thymus : ?  
 (1) larynx (2) Spinal Cord (3) Throat (4) Chest  
**Sol. (4)**
39. Vine : Grapes :: Poppy : ?  
 (1) Opium (2) Tobacco (3) Pears (4) Pineapple  
**Sol. (1)**
40. Karnataka : Gold :: Madhya Pradesh : ?  
 (1) Diamond (2) Iron (3) Copper (4) Gems  
**Sol. (3)**

**Directions:**

**Questions (41 to 45) :** In these Questions, one word is coded according to a particular pattern and the candidate is asked to give the code letters for the another word following the same pattern.

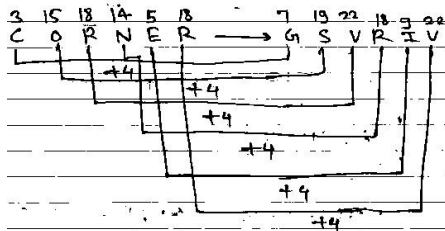
41. In a certain code, LAWN is written as JCUP. How will SLIT be coded in that code?  
 (1) QNGV (2) QJGV (3) QNVG (4) NJGV  
**Sol. (1)**  
 $\therefore \text{ALIT} \rightarrow \text{QNGV}$
42. In a given code, SISTER is coded as 535301. UNCLE as 84670 and BOY as 129. How is RUSTIC written in the code?  
 (1) 633185 (2) 185336 (3) 363815 (4) 581363  
**Sol. (2)**
43. In a certain code, LONG is written as 5123 and GEAR is written as 3748. How is LANE written in that code?  
 (1) 5427 (2) 5247 (3) 5847 (4) 5237  
**Sol. (1)**
- $\text{LONG} \rightarrow 5123$        $\text{GEAR} \rightarrow 3748$   
 $L \rightarrow 5$        $G \rightarrow 3$   
 $O \rightarrow 1$        $E \rightarrow 7$   
 $N \rightarrow 2$        $A \rightarrow 4$   
 $G \rightarrow 3$        $R \rightarrow 8$
44.  $\text{LONG} \rightarrow 5427$   
 In a certain code, READ is written as #5%6 and PAID is written as \$%46. How is RIPE written in that code?  
 (1) #4\$5 (2) #6\$5 (3) \$4#5 (4) \$4#6

**Sol. (1)**

READ  $\rightarrow$  #5%6      PAID  $\rightarrow$  \$%46  
 $R \rightarrow \#$        $P \rightarrow \$$   
 $E \rightarrow 5$        $A \rightarrow \%$   
 $A \rightarrow \%$        $I \rightarrow 4$   
 $D \rightarrow 6$        $D \rightarrow 6$

45. In a code, CORNER is written as GSVRIV. How can CENTRAL be written in that code?  
(1) DFOUSBM      (2) GIRXVEP      (3) GNFKER      (4) None of these

**Sol. (2)**



$\therefore$  CENTRAL  $\rightarrow$  GIR  $\times$  VEP

**Directions:**

**Questions (46 to 49) :** In each of the following Questions, four words are given. Which one of them will come in the third position, if all of them are arranged alphabetically as in a dictionary?

46. 1. Bishop      2. Bifocal  
3. Bicycle      4. Bitter  
(1) Bishop      (2) Bicycle      (3) Bifocal      (4) Bitter

**Sol. (1)**

47. 1. Parasite      2. Party  
3. Petal      4. Paste  
(1) Party      (2) Paste      (3) Parasite      (4) Petal

**Sol. (2)**

48. 1. Research      2. Rational  
3. Round      3. Rustic  
(1) Rational      (2) Research      (3) Round      (4) Rustic

**Sol. (3)**

49. 1. Nature      2. Native  
3. Narrate      4. Diastole  
(1) Native      (2) Nature      (3) Narrate      (4) Diastole

**Sol. (1)**

**Directions :**

**Questions (50 to 55) :** From the given five groups of letters, four of them are similar to each other in some manner, while one is different and this is to be chosen from the four alternative answers.

50. DE, PQ, TU, MO, FG  
(1) DE      (2) PQ      (3) TU      (4) MO



Sol. (4)

4	5	16	17	28	29	13	15	6	7
D	E	P	Q	T	U	M	O	F	G
4-5=-1	16-17=-1	28-29=-1	13-15=-2	6-7=-1					

MO

51. XW, FG, ML, PO, TS

(1) XW

(2) FG

(3) ML

(4) PO

Sol. (2)

Difference of each pair of letters is equal to 1. So answer is **FG** because here difference is -1.

52. BD, MP, NQ, HK, TW

(1) BD

(2) MP

(3) NQ

(4) HK

Sol. (1)

In BD difference of B and D is equal to -2 but rest of other difference are -3. So BD is odd.

53. AE, AI, IO, EI, OU

(1) AE

(2) AI

(3) IO

(4) EI

Sol. (2)

AE, IO, EI, OU are consecutive vowels but AI is non consecutive vowel, so answer is AI.

54. KP, MN, HR, GT, EV

(1) KP

(2) MN

(3) HR

(4) GT

Sol. (3)

Sum of number of plphabet are 27 except option (c).

55. Monday, Tuesday, Thursday, Saturday

(1) Monday

(2) Tuesday

(3) Thursday

(4) Saturday

Sol. (1)

Monday = 1

Tuesday = 2

Thursday = 4

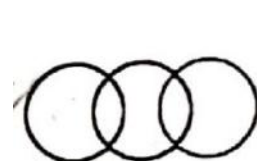
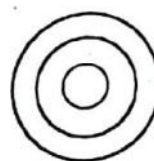
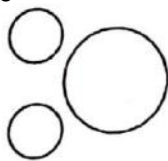
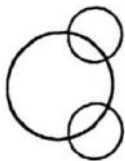
Saturday = 6

All even days except Monday.

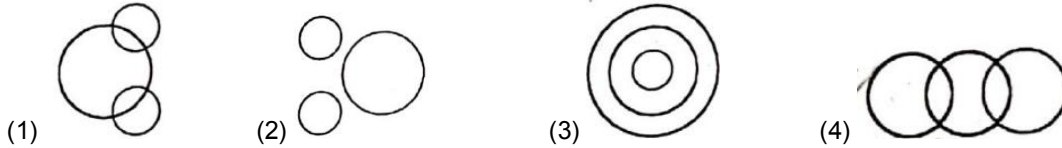
**Directions:**

**Questions (56 to 60) :**

56. Which of the following diagrams indicates the best relation between Hockey, Football and Cricket?

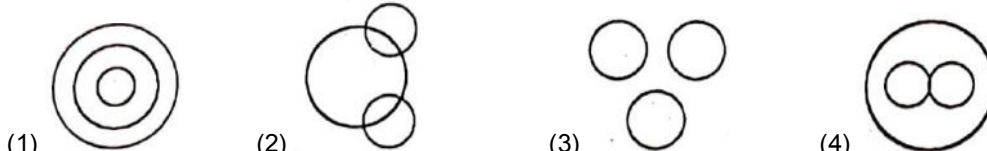


57. Which of the following diagrams indicates the best relation between Iron, Lead and Nitrogen?



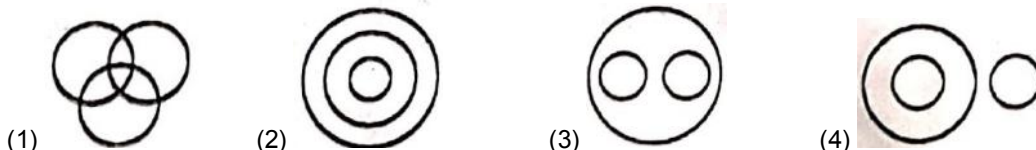
Sol. (2)

58. Which of the following diagrams indicates the best relation between Moon, Sun and Earth?



Sol. (3)

59. Which of the following diagrams indicates the best relationship between Hospita, Nurse and Patient?



Sol. (3)

60. Which of the following diagrams indicates the best relationship between Mercury, Zinc and Metal?

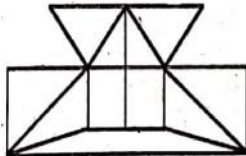


Sol. (2)

**Directions:**

**Questions (61 to 65)**

These Questions are based on analytical reasoning.

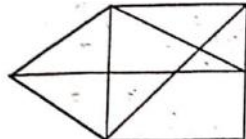


61. Find the minimum number of straight lines required to make the given figure.

- (1) 16 (2) 17 (3) 18 (4) 19

Sol. (2)

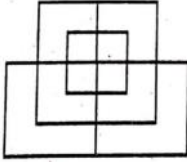
62. The number of triangles in the figure.



- (1) 12 (2) 13 (3) 14 (4) 15

Sol. (3)

63. Find the number of straight lines required to make the given figure.



(1) 13

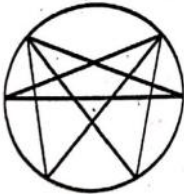
(2) 15

(3) 17

(4) 19

Sol. (1)

64. The number of triangles in the given figure.



(1) 22

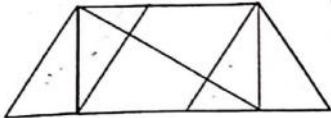
(2) 24

(3) 26

(4) 28

Sol. (1)

65. The number of triangles in the given figure.



(1) 8

(2) 10

(3) 12

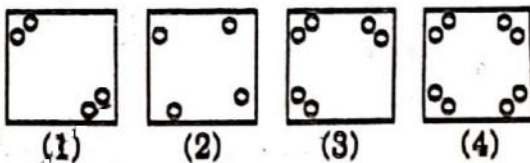
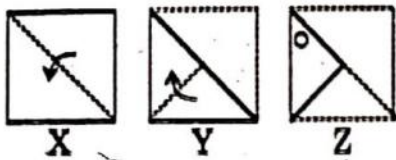
(4) 14

Sol. (4)

**Directions:**

**Questions (66 to 70) :** Each of the following questions consists of a set of three figures X, Y and Z showing a Sequence of folding of a piece of paper. Figure (Z) shows the manner in which the folded paper has been cut. These three figures are followed by four answer figures from which you have to choose a figure which would mostly closely resemble the unfolded form of figure (Z).

66.



(1) 1

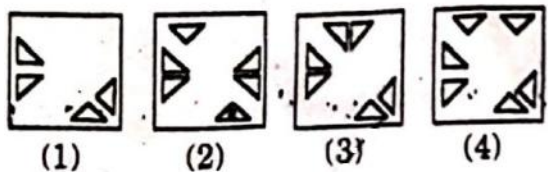
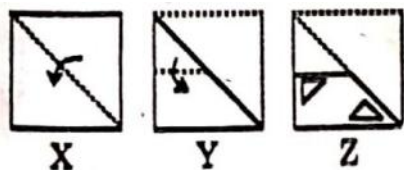
(2) 2

(3) 3

(4) 4

Sol. (1)

67.



(1) 1  
(3)

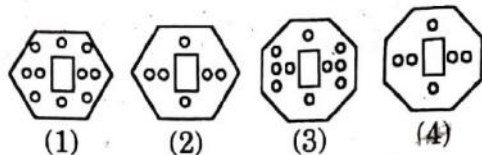
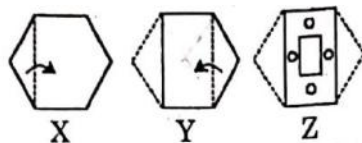
(2) 2

(3) 3

(4) 4

Sol.

68.



(1) 1  
(4)

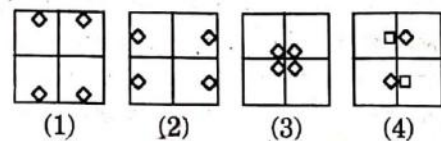
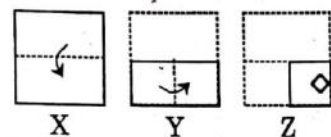
(2) 2

(3) 3

(4) 4

Sol.

69.



(1) 1  
(2)

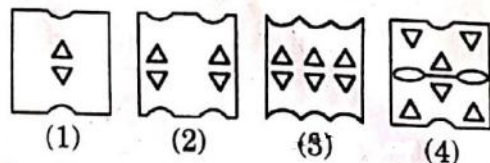
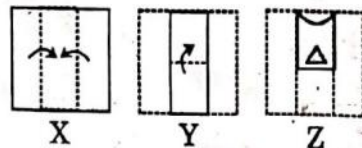
(2) 2

(3) 3

(4) 4

Sol.

70.



(1) 1  
(3)

(2) 2

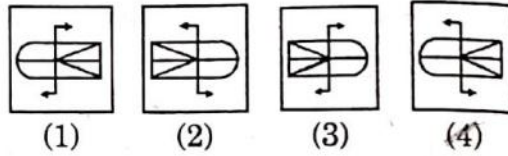
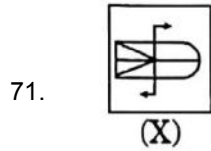
(3) 3

(4) 4

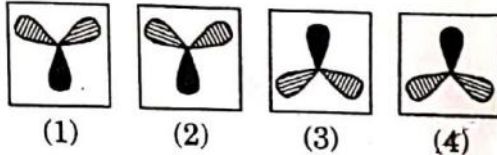
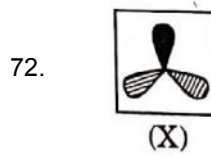
Sol.

**Directions:**

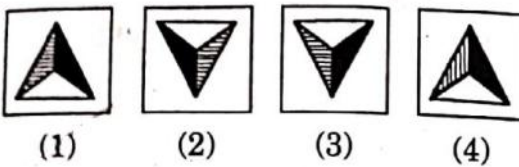
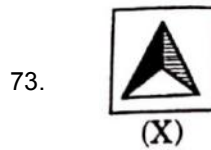
**Questions (71 to 75):** In each of the following questions, choose the correct mirror images of the given fig. (X) from amongst the four alternative (1), (2), (3), (4) given along with it. Mirror is placed right to each figure.



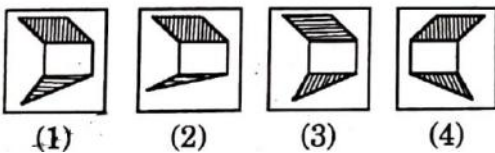
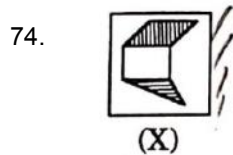
Sol. (1) 1 (2) 2 (3) 3 (4) 4



Sol. (1) 1 (2) 2 (3) 3 (4) 4

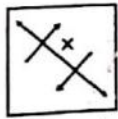


Sol. (1) 1 (2) 2 (3) 3 (4) 4

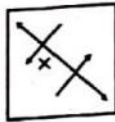


Sol. (1) 1 (2) 2 (3) 3 (4) 4

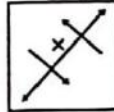
75.



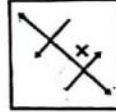
(X)



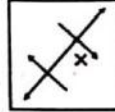
(1)



(2)



(3)



(4)

Sol.

(1) 1  
(2)

(2) 2

(3) 3

(4) 4

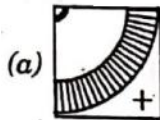
**Directions: Questions (76 to 80) :**

The reflection of an object as seen in water is called its water image. It is the inverted image. Find the water image of the figure (X) from the four alternative answers.

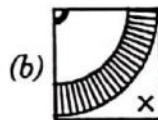
76.



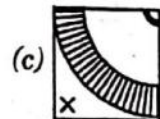
(X)



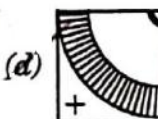
(a)



(b)



(c)



(d)

Sol.

(1) (a)  
(4)

(2) (b)

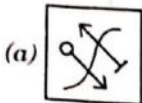
(3) (c)

(4) (d)

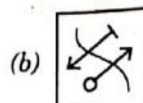
77.



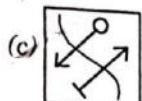
(X)



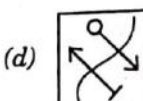
(a)



(b)



(c)



(d)

Sol.

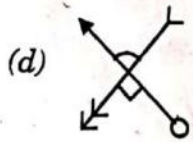
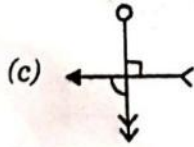
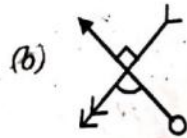
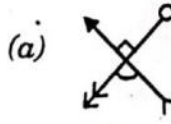
(1) (a)  
(3)

(2) (b)

(3) (c)

(4) (d)

78.



Sol.

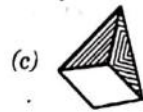
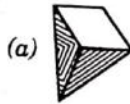
(1) (a)  
(2)

(2) (b)

(3) (c)

(4) (d)

79.



Sol.

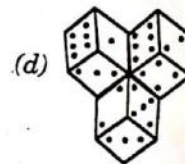
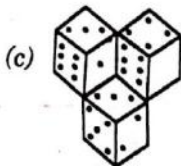
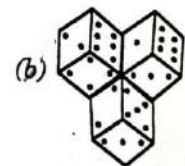
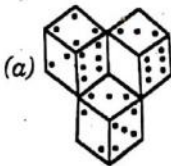
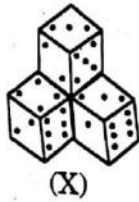
(1) (a)  
(2)

(2) (b)

(3) (c)

(4) (d)

80.



Sol.

(1) (a)  
(2)

(2) (b)

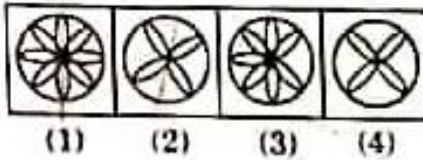
(3) (c)

(4) (d)

**Directions:**

**Questions (81 to 85) :** In each of the following questions choose the figure which is different them the next

81.



(1) 1  
(3)

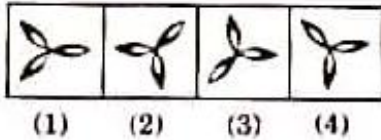
(2) 2

(3) 3

(4) 4

**Sol.**

82.



(1) 1  
(4)

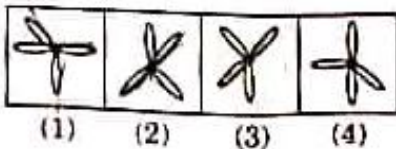
(2) 2

(3) 3

(4) 4

**Sol.**

83.



(1) 1  
(3)

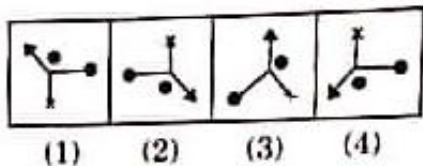
(2) 2

(3) 3

(4) 4

**Sol.**

84.



(1) 1  
(3)

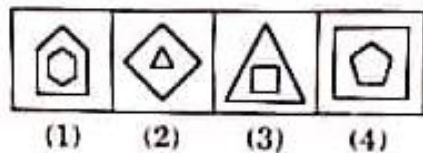
(2) 2

(3) 3

(4) 4

**Sol.**

85.



(1) 1  
(2)

(2) 2

(3) 3

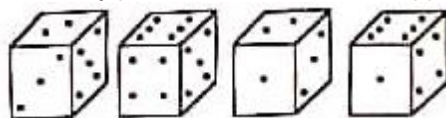
(4) 4

**Sol.**

**Directions:**

**Questions (86 to 90):**

86. How many points will be on the face opposite to face, which contains 2 points?



(1) 1  
(4)

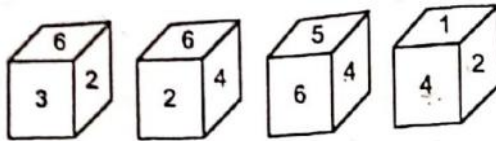
(2) 2

(3) 3

(4) 4

**Sol.**





(1) 4  
(2)

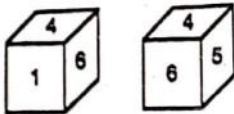
(2) 1

(3) 2

(4) 5

Sol.

88. Two positions of a dice are shown below. When number '1' is on the top, what number will be at the bottom?



(1) 3  
(2)

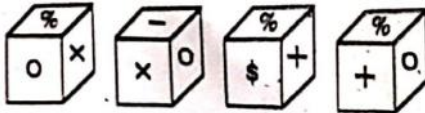
(2) 5

(3) 2

(4) 6

Sol.

89. Here 4 positions of a cube are shown. Which sign will be opposite to '+'?



(1) %  
(3)

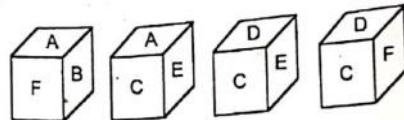
(2) -

(3) x

(4) \$

Sol.

90. The position of a cube are shown below. Which letter will be on the face opposite to face with A?



(1) D  
(1)

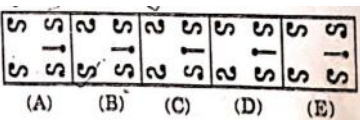
(2) B

(3) C

(4) F

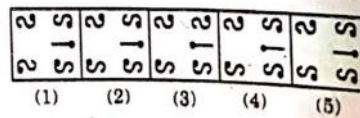
Sol.

**Directions: (Questions 91 to 95) :** Each of the following questions consists of five figures marked A,B,C,D and E called the problem figures; marked 1, 2, 3, 4 and 5 called the answer figures. Select a figure which will continue the same series as established by the five figures.



91.

Answer figures



(1) 1  
(2)

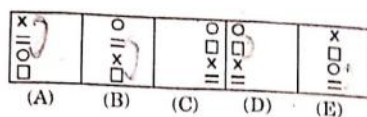
(2) 2

(3) 3

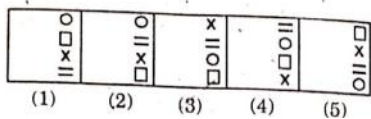
(4) 4

Sol.

92.



Answer figures



Sol.

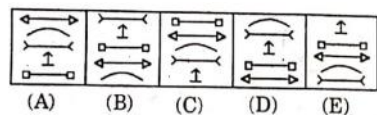
(1) 1  
(3)

(2) 2

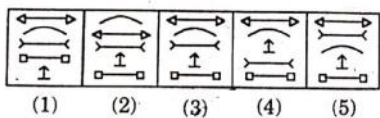
(3) 3

(4) 4

93.



Answer figures



Sol.

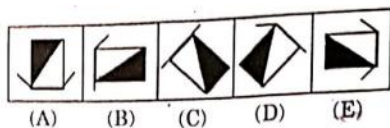
(1) 1  
(3)

(2) 2

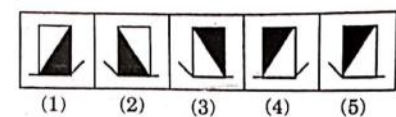
(3) 3

(4) 4

94.



Answer figures



Sol.

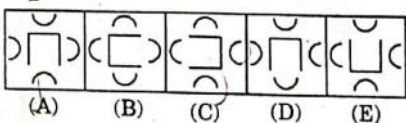
(1) 1  
(3)

(2) 2

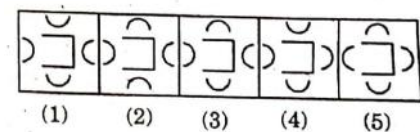
(3) 3

(4) 4

95.



Answer figures



Sol.

(1) 1  
(2)

(2) 3

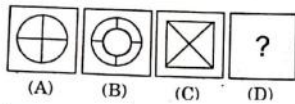
(3) 2

(4) 5

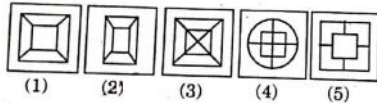
**Directions : Questions 96 to 100 :** Each of the following questions consists of two sets of figures. There is a definite relationship between figures A and B. Establish a similar relationship between figures C and D by selecting suitable figure the answer set

96.

*Problem figures*



*Answer figures*



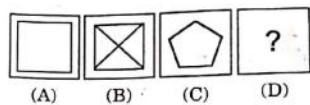
**Sol.**  
97.

(1) 1  
(1)

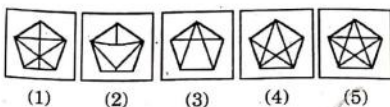
(2) 2

(3) 3

(4) 4



*Answer figures*



**Sol.**  
(3)

(1) 2  
(3)

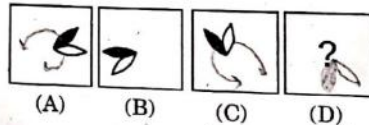
(2) 3

(3) 5

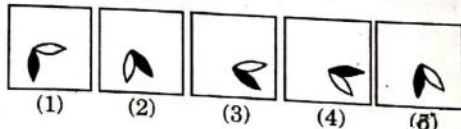
(4) 4

98.

*Problem figures*



*Answer figures*



**Sol.**  
(1)

(1) 5  
(1)

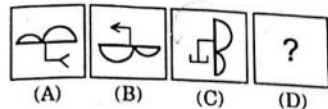
(2) 3

(3) 4

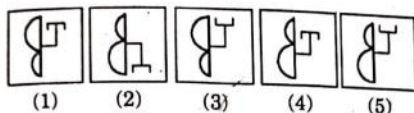
(4) 1

99.

*Problem figures*



*Answer figures*



**Sol.**  
(2)

(1) 4  
(2)

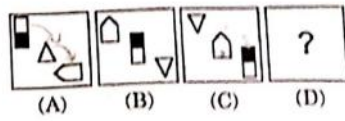
(2) 4

(3) 2

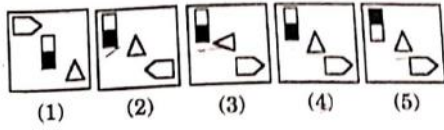
(4) 3

100.

*Problem figures*



*Answer figures*



Sol. (1) 1 (2) 2 (3) 3 (4) 4