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**NATIONAL TALENT SEARCH EXAMINATION
(NTSE-2017) STAGE -1
MAHARASHTRA STATE : MAT**

Date: 06/11/2016

Max. Marks: 50   **SOLUTIONS**   **Time allowed: 45 mins**

Directions: Q.1 and Q.2.

In the following questions a specific group is given. From the given alternatives, find out the right term which matches the given group.

1.   37, 46, 28
(1) 56   (2) 55   (3) 54   (4) 83

Ans. *(2)*

Sol.   37, 46, 28   55
+9   -18   +27

2.   22TB, M23K, QR35
(1) H22K   (2) N29O   (3) 35YZ   (4) Q47X

Ans. (2)

Sol.   T(20) + B(2) = 22
M(13) + K(11) = 24
Q(17) + R(18) = 35
Option analysis
N(14) + O(15) = 29 ✓
H(8) + K(11) = 19 ✗
Y(25) + Z(26) = 51 ✗
Q(17) + X(24) = 41 ✗

3.   Alphabet series

x c w m v c x w m w m x c x w m x m

In the given alphabet series how many times m is succeeded by w and preceeded by w?

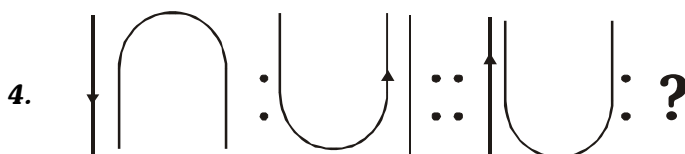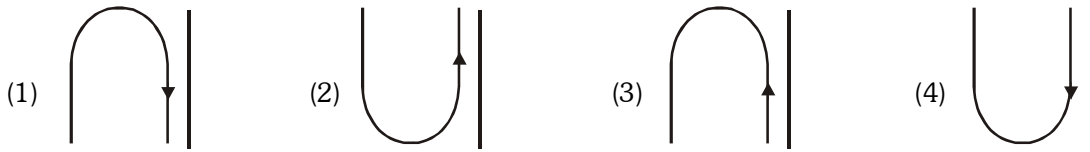(1) 1   (2) 0   (3) 2   (4) 3

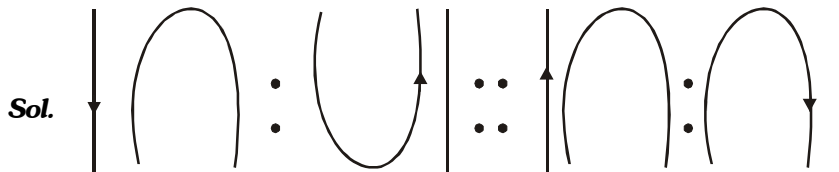***Ans.*** X C W M V C X │ W M W │ M X C X W M X

Sol.

Directions: Q.4 and Q.5.

In the following questions there is a specific relationship between the first and second figures. The same relationship exists between the third and fourth figure which will replace the question mark. Select the correct term from the alternatives given.
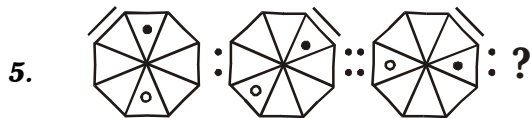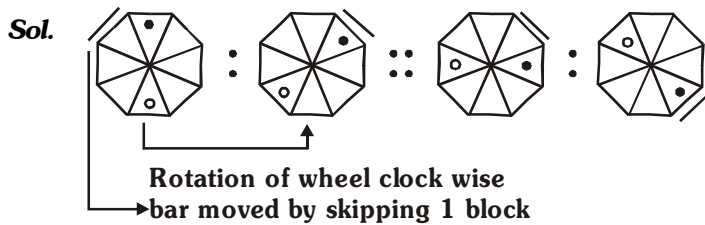
4.

(1)   (2)   (3)   (4)

Ans. (1)

Sol.

place changed, sign given to $\boxed{U}$ and inverted

5.

(1)   (2)   (3)   (4)

Ans. (3)

Sol.

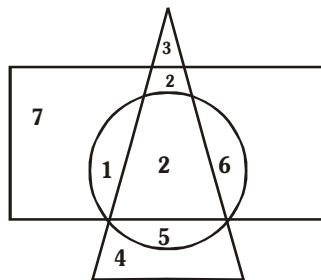   **Rotation of wheel clock wise**
   bar moved by skipping 1 block
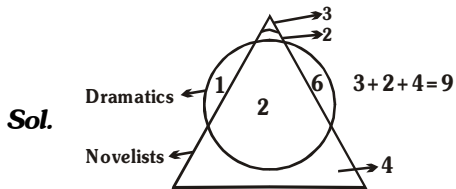
Directions: Q.6 and Q.7:

In the following Venn diagram, rectangle represents no. of poets, triangle represents no. of novelists and circle represent no. of dramatists. Answer the following questions.

6. How many are novelists but not dramatists?

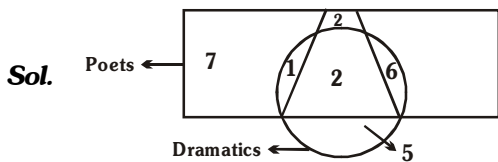(1) 7   (2) 9   (3) 8   (4) 3

Ans. (2)

Sol.

7. How many are dramatists but not poets?

(1) 5   (2) 8   (3) 13   (4) 22

Ans. (1)

Sol.

Directions: Q. 8 and Q.9:

Write which number in sequence replaces the questions mark.

8. $11\dfrac{1}{9}, 12\dfrac{1}{2}, 14\dfrac{2}{7}, 16\dfrac{2}{3}, ?$

(1) $8\dfrac{1}{3}$ (2) $19\dfrac{1}{2}$ (3) 20   (4) $22\dfrac{1}{3}$

Ans. (3)

Sol. $11\dfrac{1}{9}, 12\dfrac{1}{2}, 14\dfrac{2}{7}, 16\dfrac{2}{3}$

$$\dfrac{100}{9}, \dfrac{25}{2}, \dfrac{100}{7}, \dfrac{50}{3} \Rightarrow \dfrac{100}{5} = 20$$

$$\Downarrow \qquad \Downarrow$$

$$\dfrac{100}{8} \qquad \dfrac{100}{6}$$
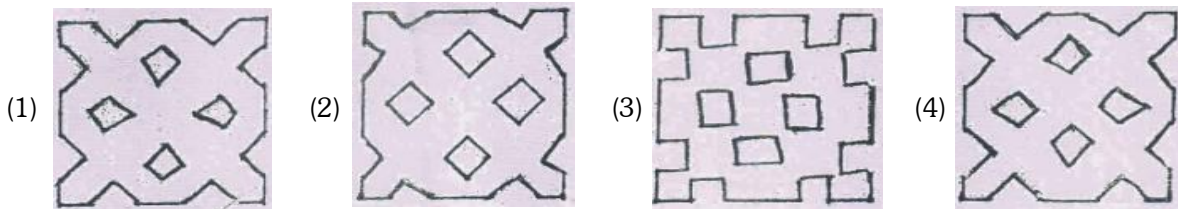
9. 2, 9, 38, 155, ?

(1) 314   (2) 193   (3) 623   (4) 624

Ans. (4)

Sol. 2, 9, 38, 155

$2 \times 4 + 1 = 9$

$9 \times 4 + 2 = 38$

$38 \times 4 + 3 = 155$

$155 \times 4 + 4 = 624$

10. A square pice of paper is folded and cut at specific spot as shown in the figure. The paper when unfolded will look like as shown in one of the alternatives. Select the correct alternative.

Question figure

(1) (2) (3) (4)

Ans. (1)

Sol. There is a ✓ sign in upper side of the figure

water image and mirror image of the same will look like a kite.

11. Find the odd term.

(1) B4J   (2) L5V   (3) H2D   (4) L1H

Ans. (4)

Sol.

	✓			✓				✗	
B	4	J	L	5	V	But	L	1	V
2	↑	10	12	↑	22		12	↑	8

$\dfrac{10-2}{2}$ $\dfrac{22-12}{2}$ $\dfrac{12-8}{2}$

12. In a row of girls Seema and Reema are ninth from right and tenth from left respectively. If they interchange their positions then Seema and Reema are seventeenth from right and eighteenth from left respectively. Find the total number of girls in the row.

(1) 27   (2) 26   (3) 25   (4) 20

Ans. (2)

Sol.
9 Reema   Seema   8
9 Seema   Reema   8
_____
                    16
           9+1+16 = 26
                    ↑
                 Seema

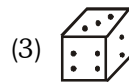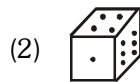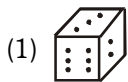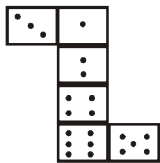**13.** The following figure is folded to form a cube. Observe the cube. Of the following cube figure find the most appropriate figure.

(1)   (2)   (3)   (4)
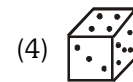
Ans. (3)

Sol. Given   Standard Form
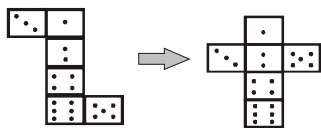
only cube (3) satisfies the net.

Directions : Q. 14 and 15:

In each of the following questions there is a specific relationship between the first and second term. The same relationship exists between the third and fourth term which will replace the question mark. Select the correct term from the alternatives given.

14. BYXC : DWVE :: ? : HSRI

(1) FVSG   (2) FTSG   (3) FUTG   (4) FTUG

Ans. (3)

Sol. B   Y   X   C
        +1 -1 -1 +2
        D   W   V   E

        H   S   R   I
        -1 +1 +1 -2
        F   U   T   G

15. 2YC24 : 4WE22 : : 6UG20 : ?

(1) 8SJ18   (2) 8SK18   (3) 8SI18   (4) 8RJ18

Ans. (3)

Sol.
```
 2    Y    C    24
+2   -1   +1   -2
 4    W    E    22

 6    U    G    20
+2   -1   +1   -2
 8    S    I    18
```

Directions : Q. 16 and Q.17:

Find the correct alternative which will replace the question mark.

16.

21		5
	21	
17		7

28		13
	30	
25		7

16		2
	?	
10		8

(1) 24   (2) 30   (3) 36   (4) 40

Ans. (2)

Sol. $(21 - 17) \times (5 + 7)/2 = 24$

$(28 - 25) \times (13 + 7)/2 = 30$

$(16 - 10) \times (2 + 8)/2 = 30$

17.

	5	
16	109	2
	6	

	21	
22	53	19
	15	

	51	
17	?	48
	13	

(1) 25   (2) 37   (3) 98   (4) 129

Ans. (1)

Sol. $(17 - 13)^2 + (51 - 48)^2 = 4^2 + 3^2 = 16 + 9 = 25$

Directions : Q. 18 and Q. 19:

In each of the following questions write which number in sequence replaces the question mark.

18. ADY, CFW, EHU, ?

(1) GIH   (2) FIT   (3) GJR   (4) GJS

Ans. (4)

Sol.
```
   A  D  Y
   C  F  W
   E  H  U
⇒ G  J  S
```

19. Y, W, T, R, O, ?

    (1) L   (2) P   (3) K   (4) M

Ans. (4)

Sol.

y,   w,   T,   R,   O   M

  -2   -3   -2   -3   -2

Directions: Q. 20 and Q. 21.

Using alphabet A to Z in sections of figure I and II a code has been created. First letter in every section is coded according to its shape and the second letter is coded using a dot.

e.g - *A is coded as ⌐| ; M is coded as .⌐|*

    K is coded as ⟩ ; P is coded as ⟩•

Figure I   *Figure II*

AM	NF	LO
BU	TV	DG
EW	IZ	XY

      JC / KP ✕ HS / RQ

20. What will be the code of SMILE?

    (1) ⟨• ⌐| ☐ ⌐|• ⌐   (2) ⟨ •⌐| ⌐•| ⌐| ⌐   (3) ⟨• •⌐| ⌐| ⌐| ⌐   (4) ⟨ ⌐| ⌐| ⌐| ⌐

Ans. (3)

Sol. S M I L E

    S   ⟨•

    M   •⌐|

    I   ⌐|

    L   ⌐|

    E   ⌐

21. What will be the code of BUKAR?

    (1) ⌐ •⌐| ⟩• ⌐| ⌃•   (2) ⌐ ⌐•| ⟩ ⌐| ⌃   (3) ⌐ ⌐•| ⟩ •⌐| ⌃•   (4) ⌐ ⌐•| ⟩ ⌐| ⌃

Ans. (4)

Sol. B U K A R

    ⌐ ⌐•| ⟩ ⌐| ⌃

22. If CH = X, then BJ = ?

    (1) T   (2) R   (3) V   (4) L

Ans. (1)

Sol. CH = X

BJ = 2 x 10 = 20

= T

23. Kiran was born on 12th September this year. Soham is 12 days younger to Kiran. In the same month Hindi day was celebrated on Friday. What is the birthday of Soham?

(1) Wednesday   (2) Sunday   (3) Saturday   (4) Monday

Ans. (4)

Sol.   Hindi Day = 14th Sept

                 = Friday

∴   Kiran's birthday = Wednesday

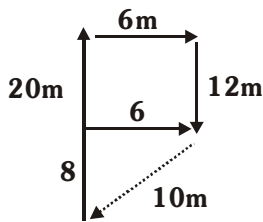∴   Soham's Birthday = 24th September

∴   Monday

24. A farmer travels 20 m north from his house. He then turns east and walks 6m, from there he again turns south and walks 12m. How far is he from his original position?

(1) 6 meter   (2) 8 meter   (3) 10 meter   (4) 14 meter
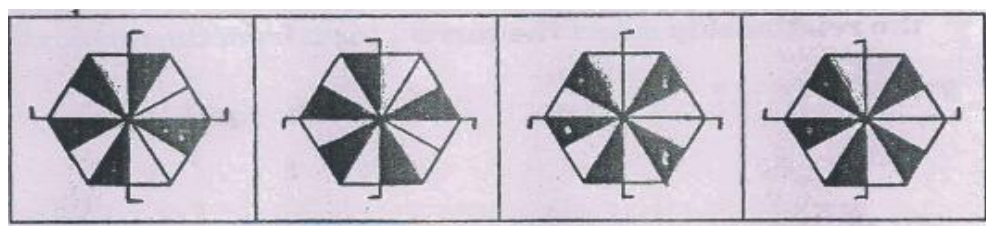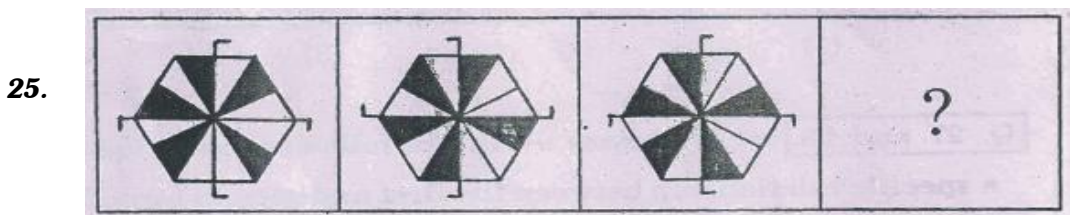
Ans. (3)

Sol.

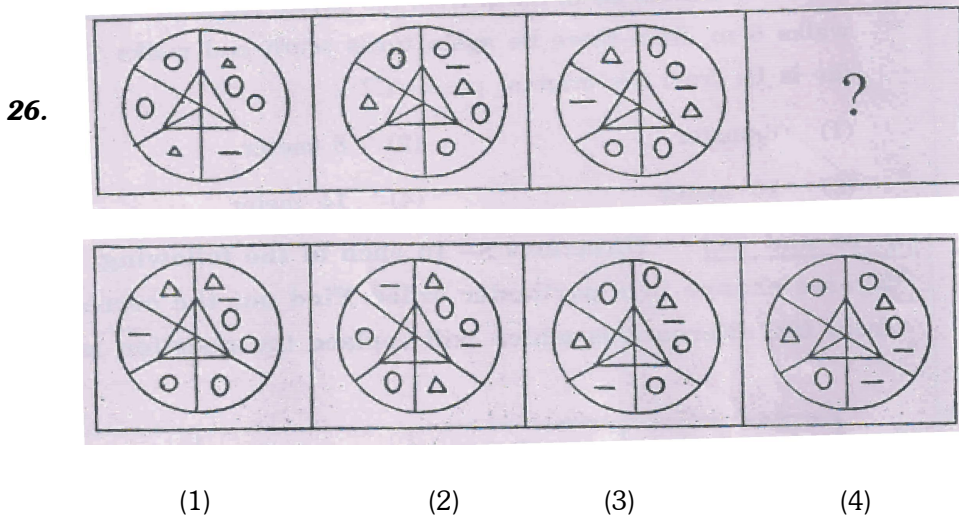*Directions: Q. 25 and Q. 26:*

In each of the following, question figures change in a particular order. Find out the correct figure from the alternatives which will replace the question mark?

25.

(1)   (2)   (3)   (4)

Ans. (4)

Sol. The shaded portion is moving 1 block anticlockwise and the horizontal bars vertical bars are opposite in direction.

26.

(1)　　　　　(2)　　　　　(3)　　　　　(4)

Ans. (2)

Sol. The smaller figures are moving 1 block clockwise and repeated in same pattern (order)

Directions: Q. 27 and Q.28 :

In the following questions there is a specific relationship between the first and second term. The same relationship exists between the third and the fourth term. Finding the relationship select the correct term from the alternatives given.

27. 4 : 38 :: ? : 100

(1) 7　　　　　(2) 5　　　　　(3) 6　　　　　(4) 10

Ans. (2)

Sol. 4 : 48 : : ? : 100

4^2 x 3 = 48　: : 5^2 x 4 = 100

28. 45 : 54 :: 46 : ?

(1) 83　　　　　(2) 72　　　　　(3) 68　　　　　(4) 58

Ans. (1)

Sol. 45 : 54 : : 46 : ?

4 x 5 = 5 x 4　　4 x 6 = 8 x 3

29. If a man facing east rotates in clockwise direction through 45^0 and later in anticlockwise direction through 270^0, then which direction is he facing?

(1) South-east　　　　　(2) West　　　　　(3) South-west　　　　　(4) South

Ans. (3)

Sol.

Directions: Q. 30 and Q. 31.

Find the odd term.

30. (1) 749   (2) 694   (3) 568   (4) 487

Ans. (1 or 4)

Sol. odd term = 749

∵ all other follow the pattern

⟹ sum of digits = 19

or 487 is the prime number.

31. (1) 4321   (2) 3212   (3) 2116   (4) 6211

Ans. (2)

Sol. odd term = 3212

∵ all other follow the pattern

⟹ sum of digits = 10

32. Directions : Observe the figure and the number of isosceles triangles which are not equilateral.

(1) 6   (2) 8   (3) 10   (4) 12

Ans. (4)

Sol. Number of isosceles Δ.

ΔJBC, ΔJDE, ΔJDG, ΔJEG, ΔNDB, ΔMEC, ΔJAB, ΔJAC, ΔDGC, ΔBGE, ΔDEC, ΔDBE.

Directions: Q. 33 and Q. 34.

Answer the following questions based on the information given below:

(1) Bhanudas, Gopal, Amar, Akhil and Chaitanya each practice one of the professions farming, Lawyer, Doctor, Teacher, Photographer.

(2) Akhil who is richer than Amar and Chaitanya is a lawyer.

(3) Farmer is the richest of all

(4) Occupation of the poorest is photography

(5) Amar is a doctor and Gopal is a photographer.

(6) Akhil is more richer than Amar but less richer than Bhanudas.

Then:

33. What is the occupation of Chaitanya?

(1) Lawyer   (2) Doctor   (3) Farmer   (4) Teacher

Ans. (4)

Sol. order

Bh > Ak > Am > G

↓   ↓   ↓

Farmer   Doctor   photographer
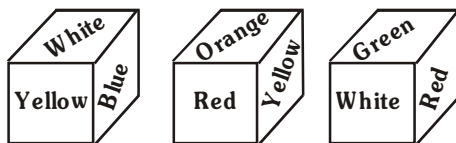
Chaitanya → Teacher

34. Who among the following is farmer?

(1) Akhil   (2) Bhanudas   (3) Gopal   (4) Chaitanya

Ans. (2)

Sol. Farmer → Bhanudas

Directions: Q. 35 and Q. 36.

Three position of a cube are shown in figure. Observe the colours and answer the following questions:

35. Which coloured surface is opposite to red coloured surface?

(1) Blue   (2) Orange   (3) Yellow   (4) White

Ans. (Bonus)

Sol. From the first two figures a different answer is coming and from the last two figures a different answer is coming

36. Which coloured surface is opposite to yellow coloured surface?

(1) White   (2) Red   (3) Orange   (4) Green
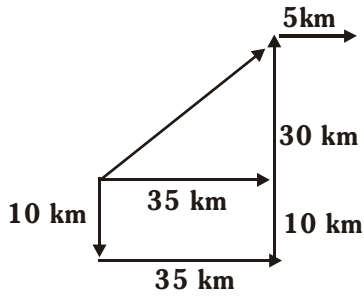
Ans. (4)

Sol. Yellow ↔ Green

37. Meghana travels 10 km towards south, then turns left and travels 35 km, again turns left and travels 40km, then she turns right and travels 5km and reaches her workplace to the bank. What is the distance between Meghana's house and bank?

(1) 50 km   (2) 39 km   (3) 40 km   (4) 30 km

Ans. (1)

Sol.

$30^2 + 35^2 = 900 + 1225 = 2125$

$5\sqrt{85} + 5$

$46 + 5 = 51$ km

5	2125
5	425
5	85
17	17
	1

38. A rhythmic arrangement of alphabets si given. The missing letter alphabets appear in the same order as in one of the alternative answers. Find the correct alternative.

- bcdbc-dcabd-bcdbc-dc-bd -
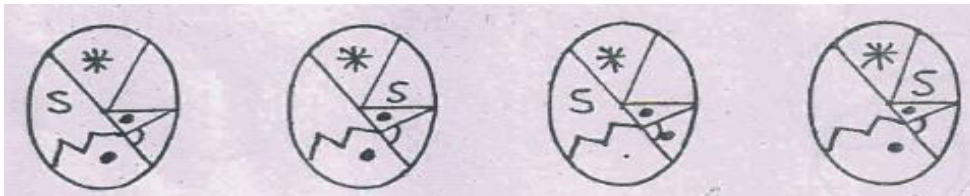
(1) aaaaa (2) bbbbb (3) ccccc (4) ddddd

Ans. (1)

Sol. Place each alphabet of each option one by one and a repeating pattern will be formed

$\Rightarrow$ a b c d | b c a d | c a b d | a b c d | b c a d | c a b d

Direction : Q. 39 and Q. 40.

Find the odd figure.

39.

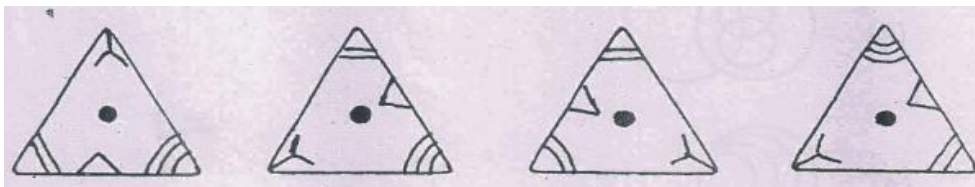(1) (2) (3) (4)

Ans. (3)

Sol. odd term $\Rightarrow$ (3) It contains ⟨· and others contain ⟨


40.

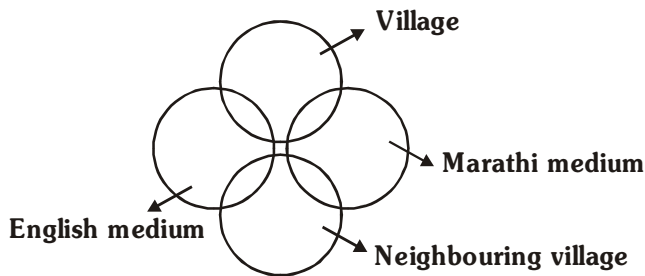(1) (2) (3) (4)

Ans. (3)

Sol. odd term $\Rightarrow$ (3). It contains ⟨ and other contain ⟨

41. Some students of a village school stay in the village itself. Some students come from neighbouring villages. Some students study in English medium, while some study in Marathi medium. Of the following figures which figure represents the above information?

(1)   (2)   (3)   (4)

Ans. (1)

Sol.

Village
Marathi medium
English medium
Neighbouring village
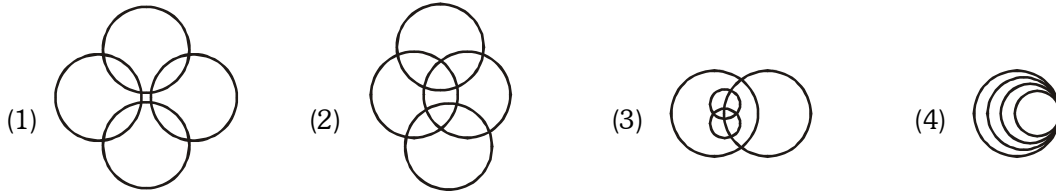
42. *Directions: In the figure given below, a transparent square shaped paper is folded along the dotted lines. What figure is obtained? Find the figure from the alternatives figures given.*

Questions figure
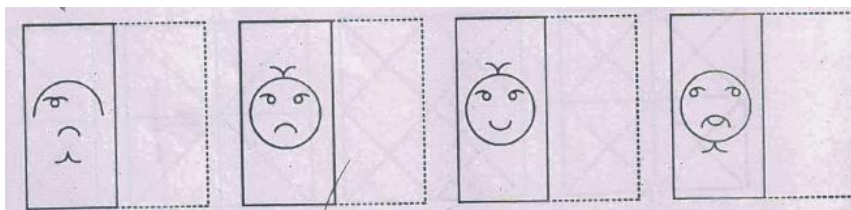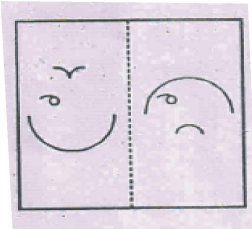
(1)   (2)   (3)   (4)

Ans. (2)

Sol.

43. A folded piece of square paper is shown as question figure. The paper is unfolded. How will it look is shown in the alternatives. Select the correct alternative.

Questions figure

(1)   (2)   (3)   (4)
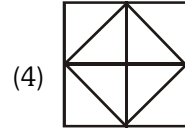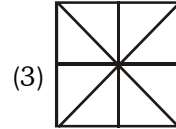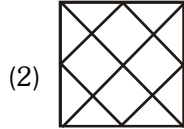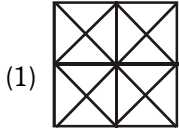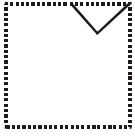
Ans. (1)

Sol. It will look like figure one.

44. In the following question, there is a specific relationship between the numbers inside the bracket and outside the bracket in each row. Find the relation and select the correct alternative to replace the question mark.

    3(45)6

    7(70)4

    5(?)8

(1) 84   (2) 78   (3) 94   (4) 100

Ans. (4)

Sol. $\dfrac{45}{18} = 2.5$

$\dfrac{70}{40} = 2.5$

$\dfrac{x}{40} = 2.5$

$\therefore x = 100$

Directions : Q. 45 and Q. 46.

In the following figure smalle cubes are arranged in a particular manner as shown. Observe the arrangement and answer the following questions.
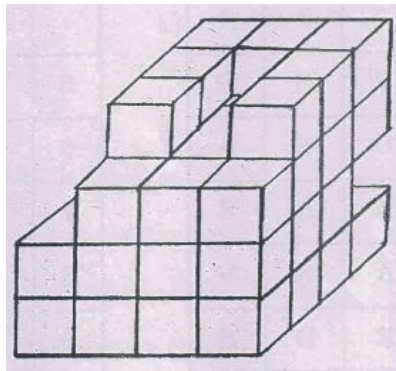
45. What is the total number of small cubes?

    (1) 52   (2) 49   (3) 47   (4) 45

Ans. (3)

Sol. number of cubes in

    top level   ⇒ 7

    second level ⇒ 12

    first level   ⇒12

    lower level ⇒ <u>16</u>

                  47

46. What is the total number of blocks whose three surfaces are seen?

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

Ans. (4)

Sol.

Directions: Q. 47 and Q. 48.

Two tables are given below in which two groups of alphabets are written. In table I the rows and columns are numbered 0-4 and in table II the rows and columns are numbered 5-9. The alphabets in the tables are represented first by their row number and then by their column number.

Eg - R is representd as R = 10, 42.

Table I

	0	1	2	3	4
0	A	R	V	N	D
1	R	N	D	V	A
2	D	V	N	A	R
3	N	D	A	R	V
4	B	A	R	D	N

Table II

	5	6	7	8	9
5	K	I	L	E	T
6	E	T	K	I	L
7	L	K	E	T	I
8	T	L	I	K	E
9	I	E	T	L	K

47. Which group of numbers represents LEAD?

    (1) 56, 65, 00, 12   (2) 75, 96, 31, 43   (3) 98, 69, 23, 14   (4) 86, 77, 41, 40

Ans. (1)

Sol. L   E   A   D

    57 65   00 12

48. Which group of numbers represents RINK?

    (1) 42, 79, 30, 78   (2) 10, 68, 43, 55   (3) 24, 87, 11, 89   (4) 01, 95, 22, 67

Ans. (4)

Sol. R   I   N K

    01, 95, 22, 67

Direction : Q. 49 and Q. 50.

Observe the pyramid of alphabets.

Answer the following questions.

```
                                a
                             b     c
                          d     e     f
                        g     h     i     j
                      k     ℓ     m     n     o
                    p     q     r     s     t     u
                  v     w     x     y     z     a     b
                c     d     e     f     g     h     i     j
              k     ℓ     m     n     o     p     q     r     s
            t     u     v     w     x     y     z     a     b     c
```

49. dheb, kqlg, cluck, ?

(1) gihd   (2) kqwp   (3) pwdv   (4) vdic

Ans. (3)

Sol.

50. bhr : cis :: rxem : ?

(1) jnsy   (2) szhq   (3) szhq   (4) dhms

Ans. (2)

Sol.

```
                                a
                             b     c
                          d     e     f
                        g     h     i     j
                      k     ℓ     m     n     o
                    p     q     r     s     t     u
                  v     w     x     y     z     a     b
                c     d     e     f     g     h     i     j
              k     ℓ     m     n     o     p     q     r     s
            t     u     v     w     x     y     z     a     b
```