



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

Date: 06/11/2016

Max. Marks: 50

SOLUTIONS

Time allowed: 45 mins

Directions (Q.1-5) : Complete the following number/letter/figural series by choosing the correct answer from the given alternatives.

1. 1, 4, 5, 10, 17, 28, 53, ?, ?

- (1) 58, 64 (2) 64, 93 (3) 78, 118 (4) 82, 161

Ans. (4)

Sol. Alternate series

2. $\frac{1}{24}, \frac{1}{12}, \frac{1}{4}, 1, 5, 30, ?$

- (1) 150 (2) 180 (3) 210 (4) 240

Ans. (3)

Sol. $\frac{1}{24}, \frac{1}{12}, \frac{1}{4}, 1, 5, 30, ?$

$$\frac{1}{24} \times 2 = 12$$

$$\frac{1}{12} \times 3 = 4$$

$$\frac{1}{4} \times 4 = 1$$

$$1 \times 5 = 5$$

$$5 \times 6 = 30$$

$$30 \times 7 = 210$$

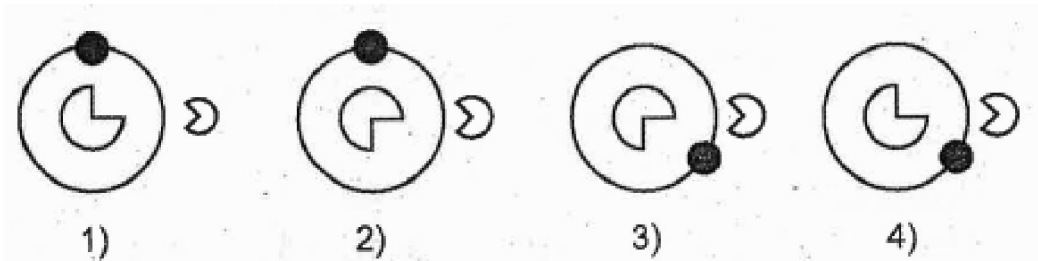
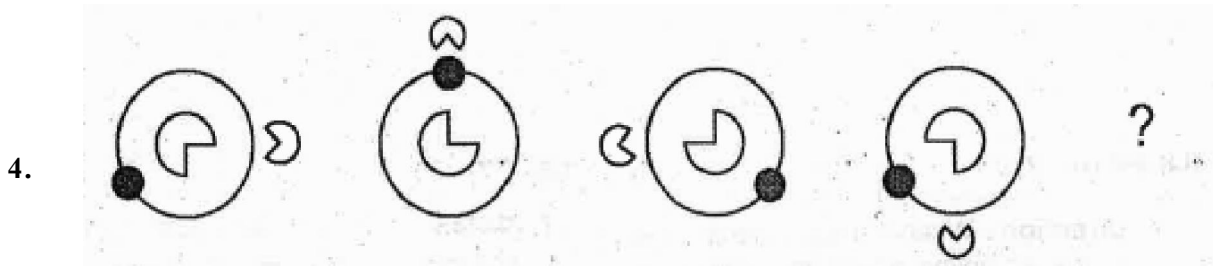
3. Z, Y, W, U, R, O, ?, G, B

- (1) K (2) I (3) H (4) J

Ans. (1)

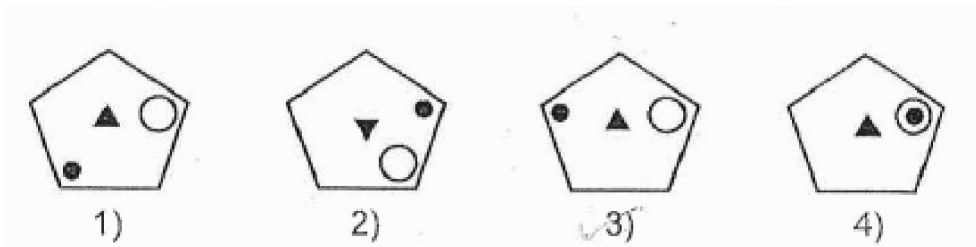
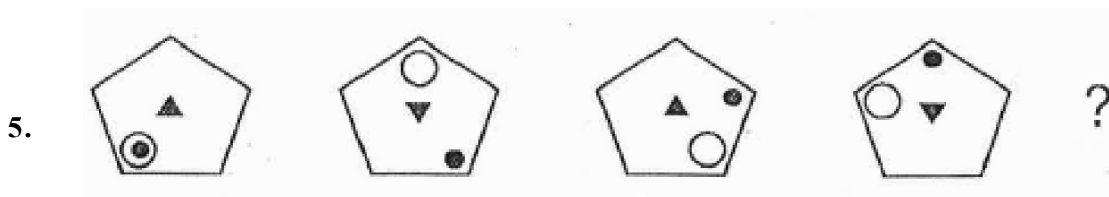
Sol. Z, Y, W, U, R, O, ?, G, B

Between Z and Y we are skipping no letter. Then between Y and W we are skipping one letter i.e V, Again one letter is skipped b/w U and W. Now U and R two letters are skipped, same for R and O



Ans. (2)

Sol. By observation



Ans. (3)

Sol. By observation

6. Direction : Choose and substitute the correct set of signs in place of * sequentially, selecting from the given alternative to make the equation meaningful.

$$90 * 100 * 10 * 100 * 110 * 10$$

- (1) +, ×, ÷, =, - (2) -, ÷, ×, +, = (3) =, ×, ÷, +, - (4) =, ÷, ×, -, +

Ans. (1)

Sol. $90 + 100 \times 10 \div 100 = 110 - 10$

$$90 + 100 \times \frac{1}{10} = 100$$

$$90 + 10 = 100$$

$$100 = 100$$

7. Direction: When the signs are changed as shown below, which one of the given equations will be correct?

– to ×

× to =

= to +

+ to ÷

÷ to –

(1) $96 - 24 + 36 = 48 \times 84 \div 12$

(2) $96 + 24 - 36 \div 48 \times 84 = 12$

(3) $96 + 24 - 36 = 48 \div 84 \times 12$

(4) $96 - 24 + 36 \times 48 \div 84 = 12$

Ans. (2)

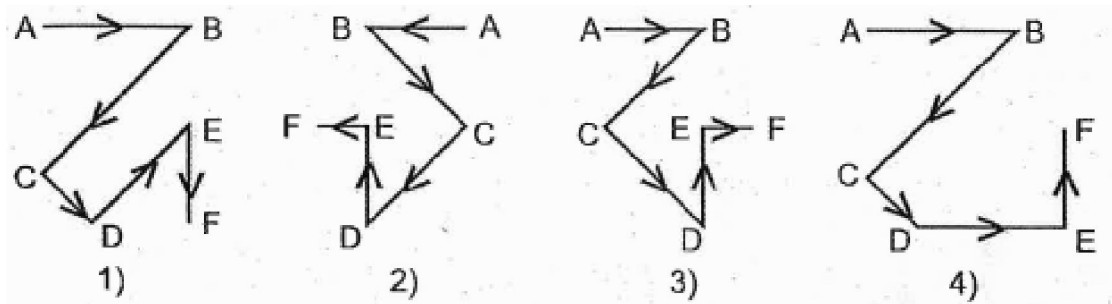
Sol. $96 \div 24 \times 36 - 48 = 84 + 12$

$4 \times 36 - 48 = 96$

$144 - 48 = 96$

$96 = 96$

8. A student starts from a place A towards East and reaches place B. From there he returns towards South West and reaches place C. He then turns towards South-East and reaches place D. From there he turns towards East and reaches a place E. He then turns towards North and finally reaches place F. Which of following figures shows his movement ?



Ans. (4)

Directions (Q.9-10) : In the following question find the missing letters in the given pattern.

L	?	T	49
?	?	D	38
?	F	?	46
51	36	46	

9. Find the missing letter in the third column.

(1) V

(2) S

(3) P

(4) M

Ans. (1)

Sol. Sum of positions of alphabets is equal to last number in the column or row.

So third column $T + D + ? = 46$

$$20 + 4 + ? = 46$$

$$24 + ? = 46$$

$$? = 22$$

Which is V

10. Find the missing letters in the second row.

(1) Q, H

(2) R, I

(3) U, M

(4) V, N

Ans. (3)

Sol. $L + ? + T = 49$

$$12 + ? + 20 = 49$$

$$? = 49 - 32$$

$$? = 17$$

$$Q = 17$$

$$Q + ? + F = 36$$

$$17 + ? + 6 = 36$$

$$? = 36 - 23$$

$$? = 13$$

$$M = 13$$

$$? + M + D = 38$$

$$? + 13 + 4 = 38$$

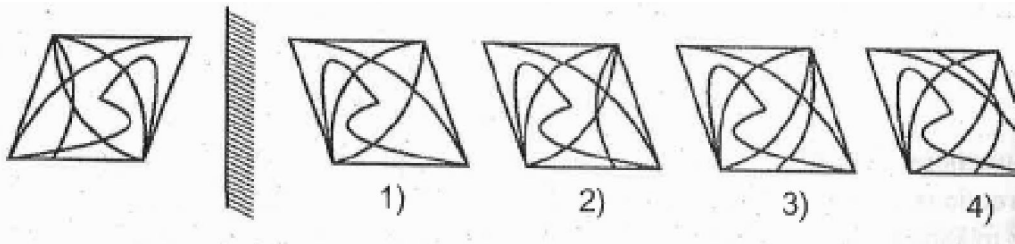
$$? = 38 - 17$$

$$? = 21$$

$$U = 21$$

Directions (Q.11-12) : A problem figure is given at the left side. Find its correct mirror image from the alternatives.

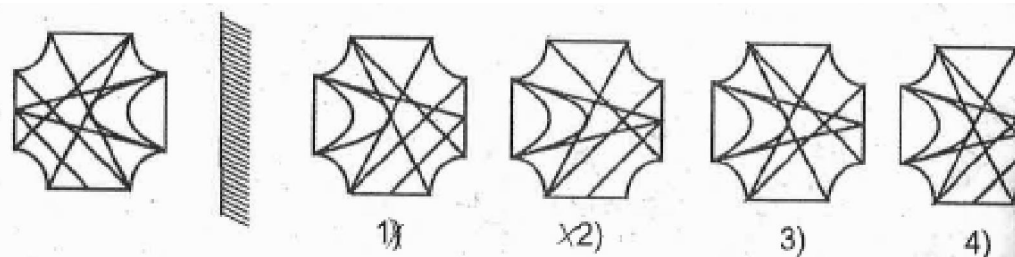
11.



Ans. (2)

Sol. By observation

12.



Ans. (4)

Sol. By observation

13. A, B, C, D and E are the members of a family.

(a) The present age of A is $1\frac{1}{2}$ times that of B.

(b) B is twice the age of C.

(b) B is twice the age of C.

(c) C is 8 years older than D.

(d) D is $1\frac{1}{2}$ times the age of E.

If the present age of E is 10 years, then find the difference between the ages of B and D.

(1) 48 years

(2) 41 years

(3) 31 years

(4) 28 years

Ans. (3)

Sol. A B C D E

 3x 2x x x - 8 $\frac{2}{3}(x-8)$

Given $\frac{2}{3}(x-8)=10$

x = 23

B = 46, D = 15, B-D = 31

Directions (Q.14-18) : Complete the given number / letter / figure analogy by choosing the correct answer from the given alternatives

14. 441 : 7 :: 576 : ?

(1) 6

(2) 8

(3) 12

(4) 14

Ans. (2)

Sol. $(3x)^2 : x :: (24)^2 : 8$

15. $\frac{73}{67} : \frac{57}{55} :: \frac{93}{87} : ?$

(1) $\frac{47}{53}$

(2) $\frac{53}{57}$

(3) $\frac{63}{61}$

(4) $\frac{73}{71}$

Ans. (4)

Sol. $73 - 2(7+1) = 57$, $67 - 2 \times 6 = 55$

$93 - 2(9+1) = 73$, $87 - 2 \times 8 = 71$

16. V B R M T H : E O I Z G U :: P F X L W A : ?

(1) K S C Y D N

(2) K S X C W N

(3) K F C Y W Z

(4) K F X C D Z

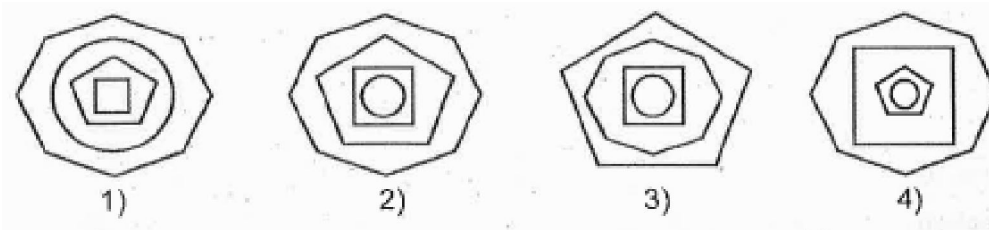
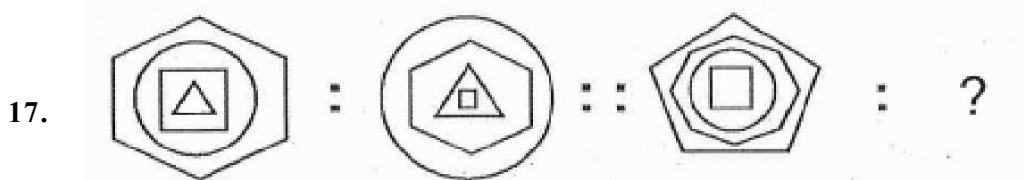
Ans. (1)

Sol. VBRMTH:EOIZGU::PFXLWA:?

ABCDEF GHIJK LMNOP QRSTUV WXYZ
 ZYXWVUTSRQPONMLKJI HGFEDCBA

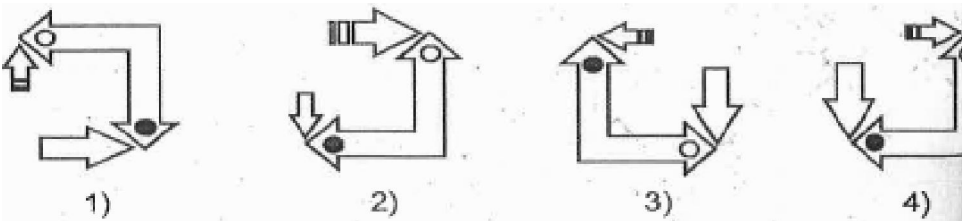
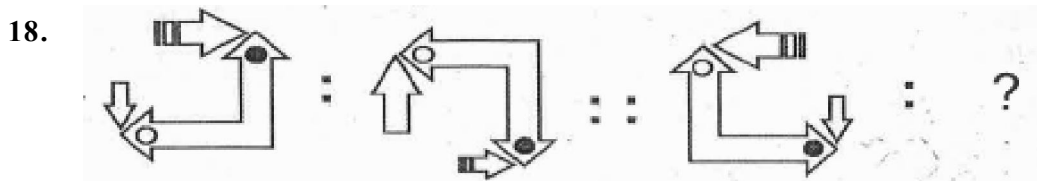
ABCDEF GHIJK LM
 NOPQRST UVWXYZ

Therefore, K S C Y D N



Ans. (2)

Sol. Fourth and third shape interchange their position, similarly second and first shape also.

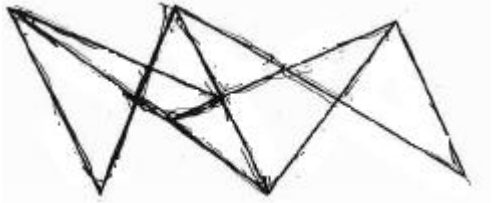


Ans. (4)

Sol. By observation

Directions (Q.19-21) : Identify the number of specified geometric shapes in the given diagrams and mark the correct answers.

19. How many triangles are there in the given figure ?

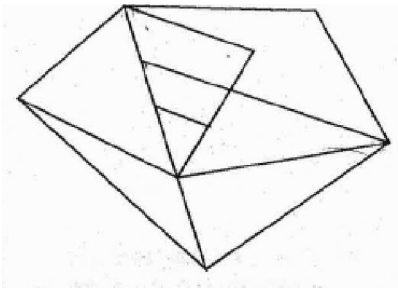


- (1) 15 (2) 14 (3) 13 (4) 11

Ans. (1)

Sol. By counting the triangles

20. How many quadrilaterals are there in the given figure ?

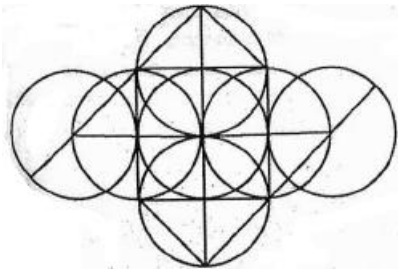


- (1) 7 (2) 8 (3) 9 (4) 10

Ans. (2)

Sol. By counting the quadrilaterals

21. How many semicircles are there in the given figure ?



- (1) 16 (2) 18 (3) 20 (4) 24

Ans. (4)

Sol. By counting the semi-circles

22. Direction : Find the missing number in the following pattern of numbers.

	6	16	15	10	7	
4	7	13	12	11	2	8
3	8	20	?	16	6	5
5	3	14	13	12	5	7
	8	17	14	15	4	

- (1) 18 (2) 20 (3) 22 (4) 26

Ans. (1)

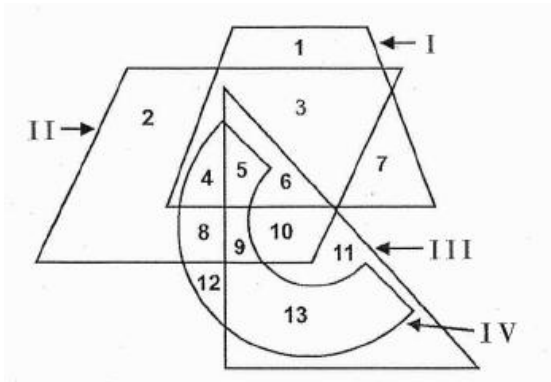
Sol. $\frac{15+12+13+14}{3} = 18$

23. P, Q, R, S, T and U are six brothers. Q is younger than P, but elder than S. T is elder than P. R and U are twins. P is elder than R and Q is younger than U. Who is the oldest ?
 (1) S (2) T (3) U (4) P

Ans. (2)

Sol. $S < Q < R = U < P < T$
 Therefore eldest is T.

Directions (Q.24-25) : The following questions are based on the given intersecting figures.



24. Which pair of numbers given below are inside any two figures only?
 (1) 9, 12 (2) 3, 11 (3) 3, 13 (4) 11, 1

Ans. (3)

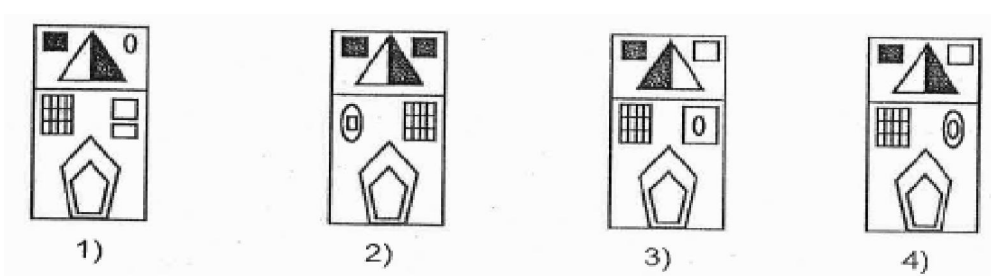
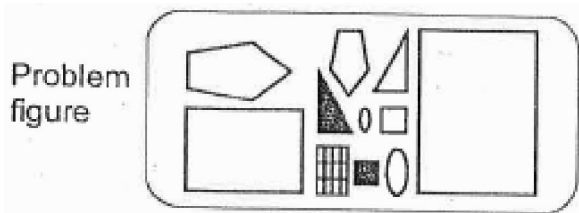
Sol. By observation

25. Which of the following number lies in the figures II, III and IV only ?
 (1) 9 (2) 5 (3) 8 (4) 10

Ans. (1)

Sol. By observation

26. In which one of the alternative figures all the given components in the problem components in the problem figure are found ?



Ans. (4)

Sol. By observation

27. Direction : Take the given statements as true and decide which of the conclusions logically follow from the statements

Statements :

1. Some doctors are students.

2. All students are men.

Conclusions :

I. All doctors are men.

II. All men are not students

III. Some men are doctors

IV. All students are doctors

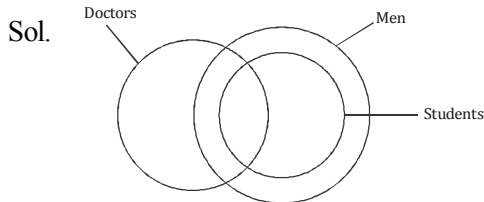
(1) Only conclusion I follows

(2) Only conclusion II follows

(3) Conclusions II and III follows

(4) Conclusions I and IV follows

Ans. (3)



Direction (Q.28-29) : In the following questions there are four groups of numbers/letters of which three are alike and one is different. Find the one which is different.

28. (1) 121 64 88

(2) 169 36 76

(3) 196 25 70

(4) 225 16 60

Ans. (2)

Sol. $\sqrt{121 \times 64} = 88, \sqrt{196 \times 25} = 70$

$\sqrt{169 \times 36} = 78$ not 76

29. (1) A S T E R O I D

(2) A Q U I F O R M

(3) A V U L S I O N

(4) A R G U M E N T

Ans. (4)

Sol. There are 3 vowels in ARGUMENT but in all other words there are 4 vowels.

Directions (Q.30 – 31) : Find the wrong number/figure in the given series.

30. 768, 96, 16, 8, 2

(1) 2

(2) 8

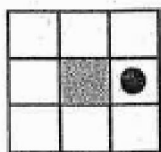
(3) 16

(4) 96

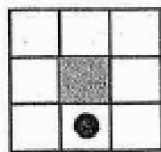
Ans. (2)

Sol. $\frac{768}{8} = 96, \frac{96}{6} = 16, \frac{16}{4} = 4, \frac{4}{2} = 2$

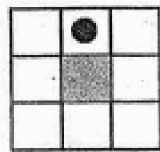
31.



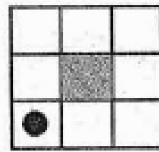
A



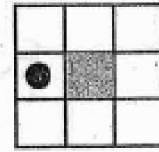
B



C



D



E

(1) B

(2) C

(3) D

(4) E

Ans. (3)

Sol. By observation

Directions (Q.32 - 33) : Find the missing number in the given matrices

32. 112 16 7 256
117 14 ? 182
143 12 11 156

- (1) 7 (2) 8 (3) 9 (4) 11

Ans. (3)

Sol. $\frac{(\text{1st column}) \times (\text{2nd column})}{\text{3rd column}} = \text{4th column}$

$$\therefore \frac{117 \times 14}{x} = 182$$

$$\therefore x = 9$$

33. 9 27 162
13 39 234
? 51 306

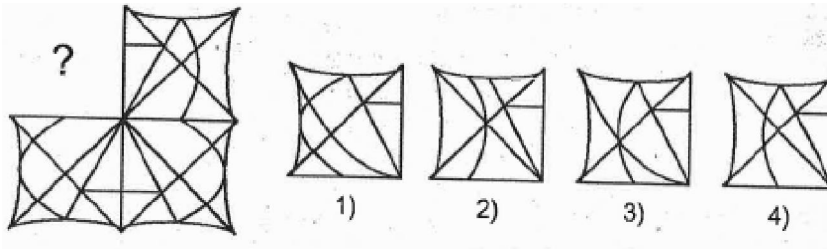
- (1) 17 (2) 21 (3) 23 (4) 31

Ans. (1)

Sol. $9 \times 3 = 27$ $27 \times 6 = 162$
 $13 \times 3 = 39$ $39 \times 6 = 234$
 $17 \times 3 = 51$ $51 \times 6 = 306$

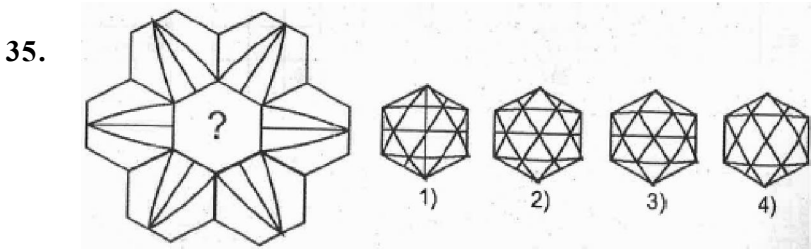
Directions (Q.34-35) : Find the missing part of the given figure from the alternatives.

34.



Ans. (4)

Sol. By observation



Ans. (2)

Sol. By observation

36. In a code if F H = 48 and K H = 88, then the code for M G B is
 (1) 166 (2) 178 (3) 182 (4) 192

Ans. (3)

Sol. FH= 48 and KH =88

$$\therefore \text{MGB} = 13 \times 7 \times 2 = 182$$

37. Direction : In a group of letters, "A P D V G H N E R M" the order of the letters is interchanged as follows:

1st and 3rd

2nd and 5th

4th and 7th

6th and 9th

8th and 10th

Find the new group of letters formed from the alternatives.

(1) G N D A V P M E H R

(2) D G A N P R V M H E

(3) D N A G P V R H M E

(4) V G N A D R P E M H

Ans. (2)

Sol. After interchanging the position of the letters

A P D V G H N E R M

D G A N P R V M H E is the new group.

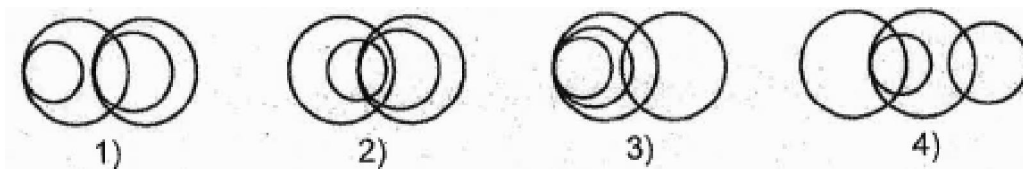
Directions (Q.38-39)

38. Which one of the following Venn diagrams represents the relationship among A, B, C and D under the conditions given below:

(a) All of C belongs to B

(b) Some part of B belongs to A

(c) Some parts of both C and B belong to D.



Ans. (4)

Sol. By observation

39. In high school the languages studied by the students are as follows:

(a) 250 students study English

(b) 180 students study Kannada

(c) 160 students study Sanskrit

(d) 100 students study both English and Kannada

(e) 80 students study both English and Sanskrit

Find the total number of students in the high school.

- (1) 410 (2) 400 (3) 340 (4) 330

Ans. (1)

Sol. $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) - n(A \cap B \cap C)$
 $= 250 + 180 + 160 - 100 - 80 - 0 + 0 = 410$

40. The Independence Day was celebrated in the year 2016 on Monday. On what day in 2018 the Republic Day will be celebrated?

- (1) Tuesday (2) Thursday (3) Friday (4) Saturday

Ans. (3)

Sol. Aug + sep + oct + nov + dec + 2017 + jan 2018

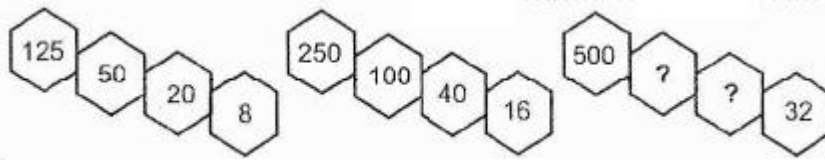
$$16 + 2 + 3 + 2 + 3 + 1 + 26 = 53$$

$$\therefore \frac{53}{7}, \text{ remainder is } 4$$

$$\therefore \text{Mon} + 4 = \text{Friday.}$$

Directions (Q.41-42) : In the questions given below the numbers in the figures are related. Identify their relationship and find the missing numbers in the given figures.

41.



- (1) 400, 175 (2) 300, 150 (3) 200, 100 (4) 200, 80

Ans. (4)

Sol. Pattern is :

$$8 \times 3 - \frac{8}{2} = 20$$

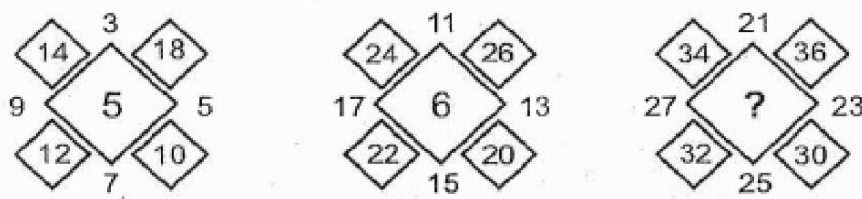
$$20 \times 3 - \frac{20}{2} = 50$$

$$50 \times 3 - \frac{50}{2} = 125$$

$$\therefore 32 \times 3 - \frac{32}{2} = 80$$

$$80 \times 3 - \frac{80}{2} = 200$$

42.



- (1) 4 (2) 5 (3) 6 (4) 7

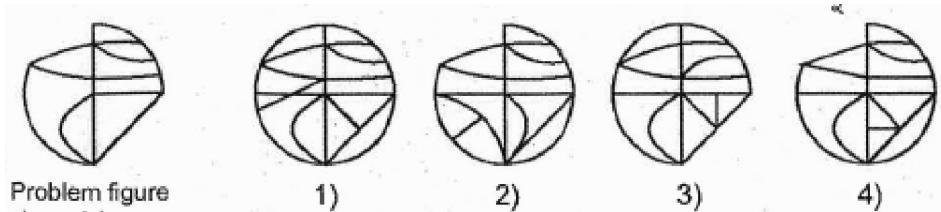
Ans. (3)

Sol. Patten is :

$$\frac{(14+18+10+12)-(9+3+5+7)}{6} = 5$$

$$\therefore \frac{(34+36+30+32)-(27+21+23+25)}{6} = 6$$

43. Directions : In the following question a problem figure is given. The problem figure is hidden in one of the figures given as alternatives. Find the figure in which the problem figure is hidden?



Ans. (1)

Sol. By observation

Direction (Q.44) : In the following question, a set of numbers is given. From the given alternatives, choose the set which is similar to the given set.

44. 169, 289, 361

(1) 25, 49, 121

(2) 49, 81, 225

(3) 225, 441, 529

(4) 441, 529, 625

Ans. (1)

Sol. 169, 289, 361

$(13)^2, (17)^2, (19)^2$

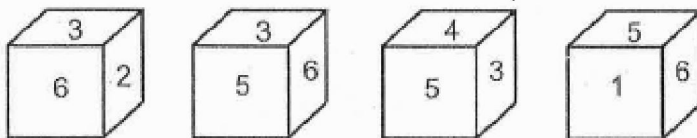
Similarly 25, 49, 121

$(5)^2, (7)^2, (11)^2$

PRIME NUMBERS

Directions (Q.45-46)

45. Different faces of cube are given below. Identify the pairs of opposite faces from the alternatives.



(1) 1, 2 ; 3, 4 ; 5, 6

(2) 1, 3 ; 2, 4 ; 5, 6

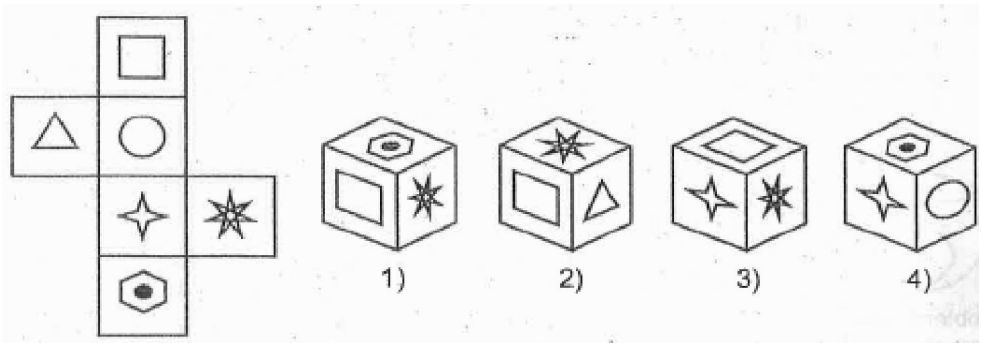
(3) 1, 3 ; 2, 5 ; 4, 6

(4) 1, 6 ; 2, 5 ; 4, 3

Ans. (3)

Sol. By observation

46. When the problem figure given at the left side is folded into a cube, which one of the cubes, will, be formed? Identify from the alternatives.



Ans. (1)

Sol. By observation

47. Direction :

$A > B$ means "A is husband of B"

$A - B$ means "A is brother of B"

$A + B$ means "A is father of B"

$A \times B$ means "A is mother of B"

If $P > Q \times R + S$, how is P related to S? Find the correct alternative.

(1) P is father of S

(2) P is grandfather of S

(3) P is uncle of S

(4) P is brother - in - law of S

Ans. (2)

48. Direction : In the given sequence how many an ODD number appears between an ODD number and an EVEN number ?

5 3 6 9 7 6 5 5 4 1 3 8 7 3 7 4 4 5

(1) 6

(2) 7

(3) 8

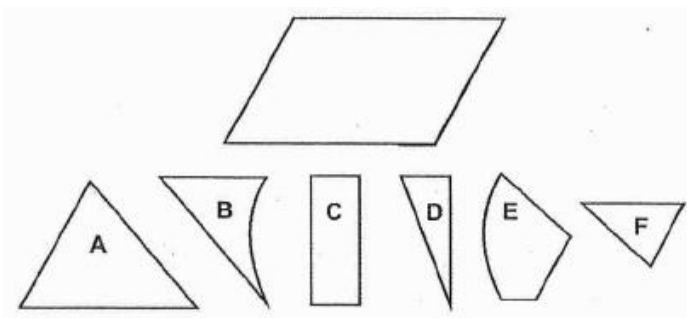
(4) 9

Ans. (4)

Sol. Nine possibilities are there

536, 697, 976, 655, 554, 413, 138, 873, 374

49. Direction : A parallelogram is given below. Among the choices given, identify which set of pairs of figure is required to form the parallelogram.



(1) A, B, E, F

(2) A, C, D, F

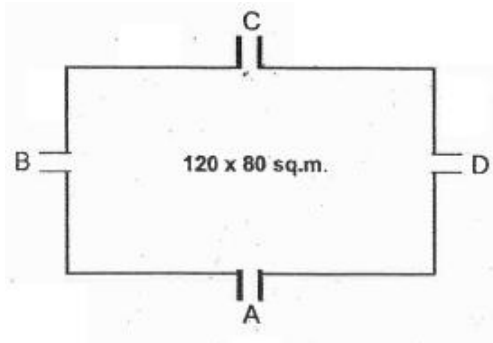
(3) A, B, C, E

(4) A, B, D, F

Ans. (1)

Sol. By observation

50. A rectangular park area 120×80 sq.m. has four gates A, B, C and D as shown in the figure.



Anil and Kiran enter the park together from gate C and start walking in the anticlockwise direction.

a) Anil completes 3 rounds and in the fourth round he exits from the gate A.

b) Kiran completes 4 rounds and in the fifth round he exits from the gate D.

Find the difference between the distance covered by them.

(1) 340 m

(2) 400 m

(3) 500 m

(4) 560 m

Ans. (3)

Sol. Anil covered total distance = 1400 m

Kiran covered total distance = 1900 m

\therefore Difference between the distance covered by them = 500 m
