MENTAL ABILITY TEST (MAT) PAPER

Q. 1 to 3: Direction In the following questions a specific group of numbers is given. From the given alternatives. Find out the correct alternative that matches the given group.

1. 150 576 252

(1*) 393 (2) 466 (3) 80 (4) 182

Sol. Multiple of 3.

2. 132 736 350

(1*) 223 (2) 72 (3) 505 (4) 993

Sol. $5^3 + 7 = 132$

$9^3 + 7 = 736$

$7^3 + 7 = 350$

$6^3 + 7 = 223$

3. 193 454 265

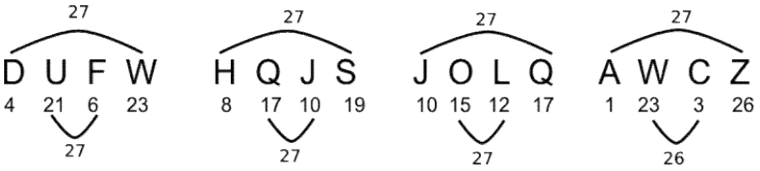
(1) 572 (2*) 823 (3) 734 (4) 367

Sol. Sum of all digits = 13

Q. 4 and 5: Direction Find the odd term.

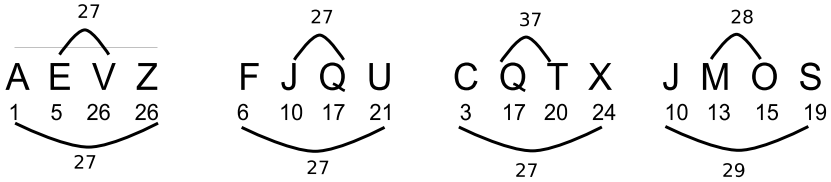
4. (1) DUFW (2) HQJS (3) JOLQ (4*) AWCZ

Sol.



5. (1) AEVZ (2) FJQU (3*) CQTX (4*) JMOS

Sol.



6. ABCDEFGHIJKLMNOPQRSTUVWXYZ

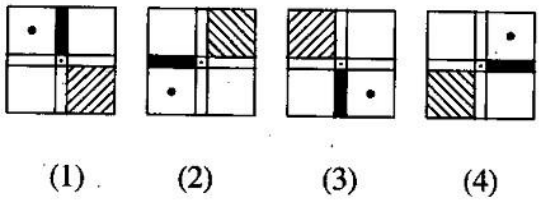
From the above alphabets which word will be formed from the given alternatives if the meaningful word formed by the 5th and 10th letter from the right and 1st and 5th letter from the left is written in the reverse order.

(1) VEAS (2) SAEV (3) AVES (4*) EVAS

Sol. Meaningful Word $\rightarrow$ SAVE

Q. 7 to 9 : Direction Find the odd figure.

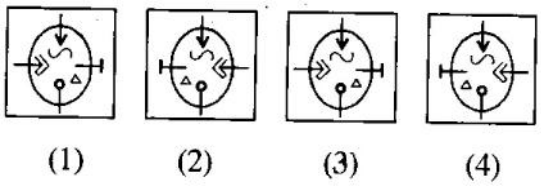
7.



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

Sol. **Bonus** (No Change in figure)

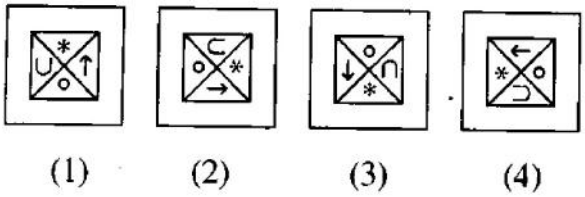
8.



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

Sol. **(1)** (By Observation)

9.



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

Sol. **Bonus** (No Change in figure)

10. In the following question there is a specific relation between first and second term. The same relationship exists between third and the fourth term. Considering the same relationship chooses the correct alternative that will replace the question mark.

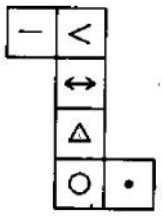
11529 : 72135 :: 152943 : ?

(1*) 213549 (2) 223649 (3) 224194 (4) 215049

Sol. Sum of digits

18 : 18 : 24 : 24

Q. 11 to 13: Direction The adjacent figure is folded to form a cube. Observe the figure and answer the following questions.



11. Which symbol will not be adjacent to the symbol '·' ?

(1) < (2*) − (3) ↔ (4) Δ

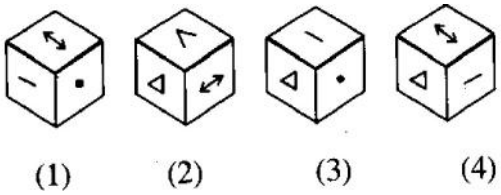
Sol. Alternate Method

12. Which symbol will be opposite to the symbol Δ ?

(1) ↔ (2) □ (3*) < (4) −

Sol. Alternate Method

13. Which of the following figure is the figure obtained by folding the paper to form a cube?

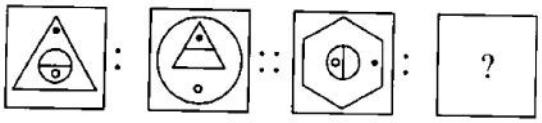


(1) (2) (3) (4)

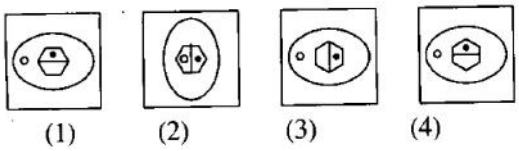
Sol. **(4)** Normal Dice Rule

Q. 14 to 16: Direction In each of the following questions, there is a specific relationship between the first and the second figure. The same relationship exists between the third and the fourth figure. Find the relation and choose the correct answer to replace the question mark.

14. Question Figure



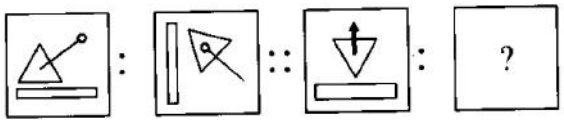
Answer Figure



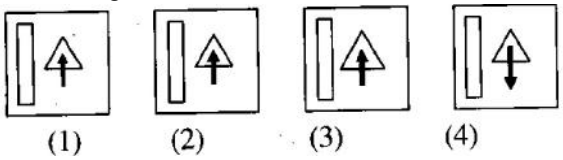
(1) (2) (3) (4)

Sol. **(3)**

15. Question Figure



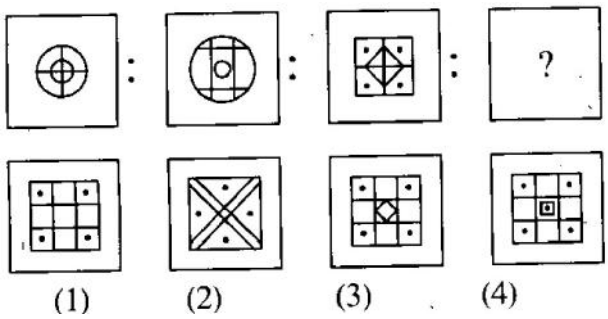
Answer Figure



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

Sol. **(1,2,3)**

16.



Sol. **(3)** (By Observation)

Q. 17 to 20: Direction In each of the following questions, choose the correct alternative that will replace the question mark in the given sequence.

17. 4, 6, 16, 62, 308, ?

(1) 990 (2) 1721 (3) 698 (4*) 1846

Sol. 4 x 2 – 2 = 6

6 x 3 – 2 = 16

16 x 4 – 2 = 64

62 x 5 – 2 = 308

308 x 6 – 2 = 1846

18. 6, 9, 18, 21, 42, 45, ? , ?

(1) 90, 91 (2) 90.92 (3*) 90, 93 (4) 90, 94

Sol.

$6 = 2 \times 3$
$9 = 3 \times 3$

$42 = 14 \times 3$
$45 = 15 \times 3$

$18 = 6 \times 3$
$21 = 7 \times 3$

$90 = 30 \times 3$
$93 = 31 \times 3$

19. 7, 13, 25, 43, 67 ?

(1*) 97 (2) 98 (3) 99 (4) 100

Sol.

7
6
13
12
25
18
43
24
67
30
97

20. 3624, 4363, 3644, 4563, 3664, ?

(1) 4263 (2) 4363 (3) 4536 (4*) 4763

Sol. 3624 = Sum of digit = 25

4363 = Sum of digit = 16

3644 = Sum of digit = 17

4563 = Sum of digit = 18

3664 = Sum of digit = 19

4763 = Sum of digit = 20

Q. 21 to 23 : Direction Atul, Tushar, Nishant and Amar are four players. Except Nishant all play cricket. Atul plays only cricket and football. Only three players play football. Tushar plays all the games except kho-kho. Only one player does not play kabaddi. Only Nishant does not play football. Nishant and Amar are expert in kho-kho.

	Cricket	Football	Kho-Kho	Kabaddi
Atul	√	√	X	X
Tushar	√	√	X	√
Nishant	X	X	√	√
Amar	√	√	√	√

21. Which game Tushar, Nishant and Amar play ?

(1) Kabaddi (2) Kho-Kho (3) Cricket (4) Football.

Sol. **(1)**

22. Who plays all the games ?

(1) Atul (2) Tushar (3) Nishant (4) Amar

Sol. **(2)**

23. Which game is played by only two players ?

(1) Cricket (2) Kabaddi (3) Football (4) Kho-kho

Sol. **(4)**

24. ab - be - c - ba - c

(1) baac (2) aabb (3*) caab (4) aaab

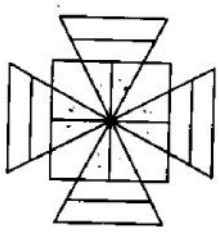
Sol. **abc** $\rightarrow$ **bca** $\rightarrow$ **cab** $\rightarrow$ **abc**

25. abb -baa - - bb - b - ab

(1) bbaba (2*) abaaa (3) abbba (4) ababa

Sol. abba $\rightarrow$ baab $\rightarrow$ abba

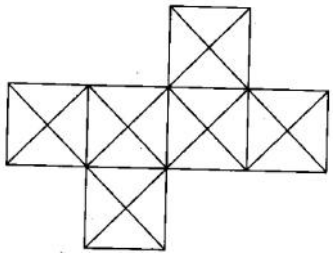
26. Find the number of triangles in the adjacent figure :



(1) 12 (2) 16 (3) 20 (4) 24

Sol. **(3)**

27. Find the number of Squares from the adjacent figure:



(1) 6 (2) 11 (3) 13 (4) 10

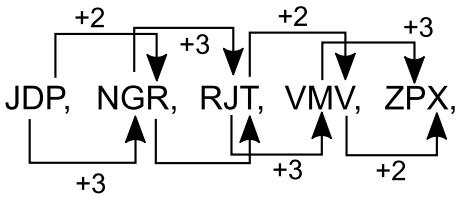
Sol. **(2)**

Q. 28 to 31: Direction Choose the correct alternative that will replace the question mark.

28. JDP, NGR, RJT, VMV, ?

(1) ZPW (2) ZQY (3*) ZPX (4) ZRY

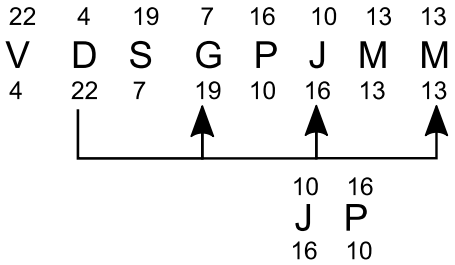
Sol.



29. $V_{422}D$, $S_{719}G$, $P_{1016}J$, $M_{1313}M$?

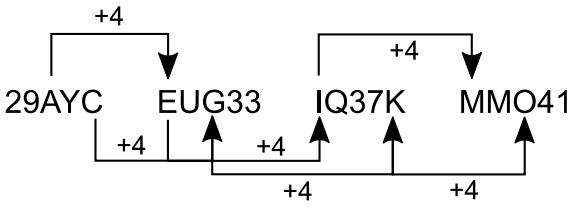
(1) $K_{1711}P$ (2*) $J_{1610}P$ (3) $J_{1611}P$ (4) $I_{1512}O$

Sol.



30. 29AYC, EUG33, IQ37K, ?

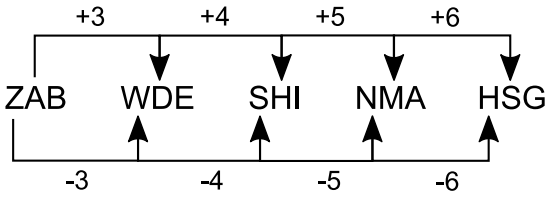
(1*) MMO_{41} (2) MZB_{41} (3) MNP_{43} (4) MPO_{44}



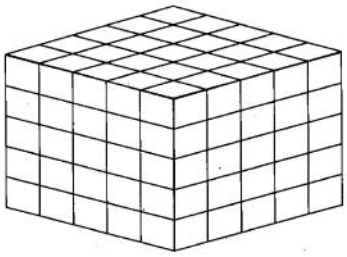
31. ZAB, WDE, SHI, NMA, ?

(1) VEF (2) UFG (3) FUG (4*) HSG

Sol.



Q. 32 to 34: Direction The bottom and the top surface of a cube, having each side 5 units, is painted black. The opposite surfaces of the cube are red. Then the cube is cut into smaller cubes having each side 1 unit. On the basis of this information choose the correct alternative to answer the questions.



32. How many cubes have at least one surface painted?

(1) 125 (2) 116 (3) 100 (4*) 98

Sol. **(4)**

33. How many cubes have only red surface?

(1) 18 (2) 30 (3) 48 (4) 60

Sol. **(2)**

34. How many cubes have surfaces in both the colours, black and red?

(1) 25 (2) 50 (3) 8 (4) 20

Sol. **(4)**

35. If in a mathematical code language

$\Delta + \nabla = 9$, $\triangleleft + \triangleright = 13$, $\triangleright + \Delta = 11$, and $\nabla + \square = 12$ then find the value of $\square$ from the following alternatives.

(1) 5 (2) 7 (3) 6 (4) 8

Sol. **Bonus**

36. In a certain code language if

$\$ \times ₹ = 35$, $E \times \$ = 30$. $₹ \times U = 63$ and $U \times \# = 36$

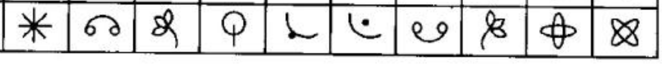
Then find the value of #.

(1) 6 (2*) 4 (3) 5 (4) 9

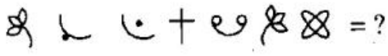
Sol. Checking factors by putting options.

Q. 37 and 38: Direction In the following table the digits are assigned with certain symbols. Observe them carefully and choose the correct alternative to answer the questions.

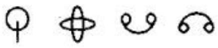
Digit	9	0	8	1	7	2	6	3	5	4

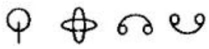
Symbol


37.



(1) 

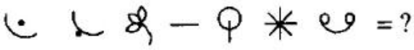
(2) 

(3) 

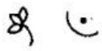
(4) 

Sol. **(3)**

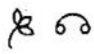
38.



(1) 

(2) 

(3) 

(4) 

Sol. **(2)**

Q. 39 and 40: Direction In the following sequence. Choose the correct term that will replace the question mark.

39.

(1) 

(2) 

(3) 

(4) 

Sol. **(2)**

40.

αβθρδ, βαθρδ, βθαρδ, βθρδα, ?

(1) βθραδ

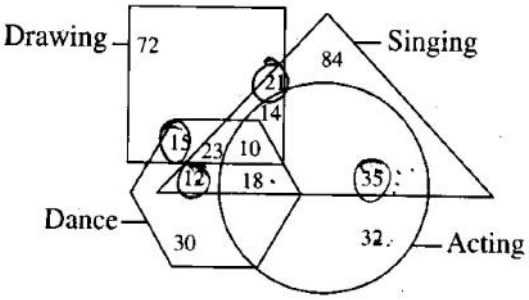
(2) βθδαρ

(3) βθδρα

(4) βθρδα

Sol. **(1)**

Q. 41 to 43: Direction In the adjacent figure the numbers represent the number of artists in different arts. Observe the diagram carefully and choose the correct alternative to answer the questions.



41. How many artists are expert in all the arts?

(1) 23 (2) 10 (3) 14 (4) 33

Sol. **(2)**

42. How many artists are good in 'acting'?

(1) 35 (2) 77 (3) 67 (4) 32

Sol. **(4)**

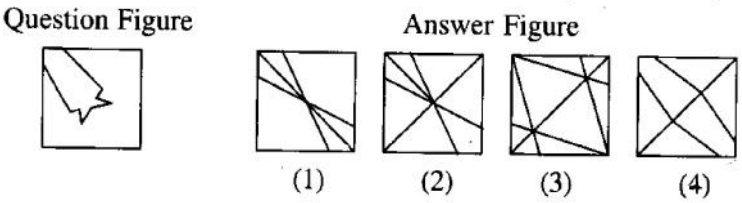
43. How many artists are good in only two arts?

(1) 65 (2) 97 (3) 83 (4) 71

Sol. **(3)**

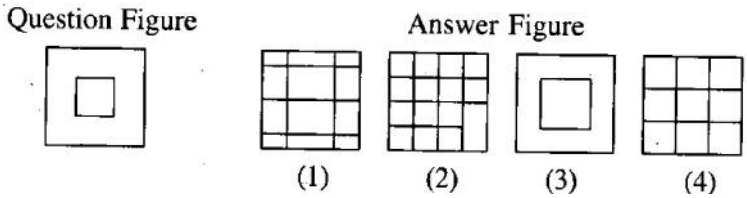
Q. 44 and 45: Direction. After folding a square piece of paper it appears as shown in the question figure. The paper when unfolded will look like as shown in one of the alternatives. Select the correct alternative.

44.



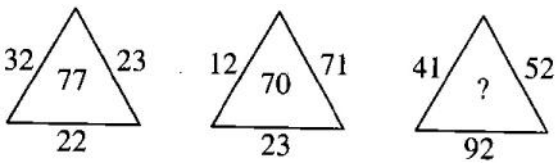
Sol. **(3)**

45.



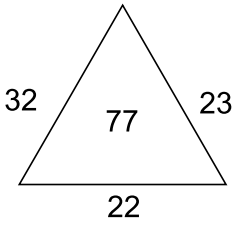
Sol. **(4)**

46.

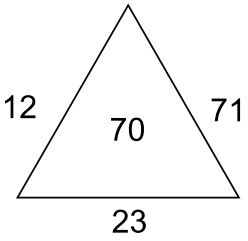


(1) 185 (2*) 68 (3) 78 (4) 93

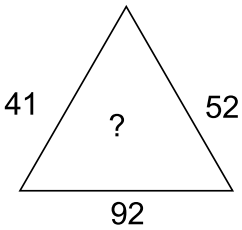
Sol.



Replace digits of $\left.\begin{matrix}23=32\\22=22\\32=23\end{matrix}\right\}32+22+23=77$

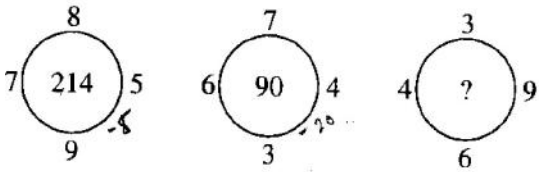


Replace $\left.\begin{matrix}71=17\\12=21\\23=32\end{matrix}\right\}17+21+32=70$



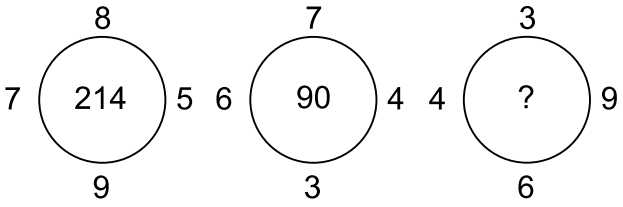
Replace $\left.\begin{matrix}41=41\\92=29\\52=25\end{matrix}\right\}14+29+35=68$

47.



(1) 54 (2) 73 (3) 92 (4*) 108

Sol.

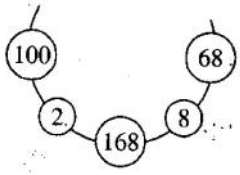


$7 \times 5 = 35$, $8 \times 9 = 72$, $107 \times 2 = 214$

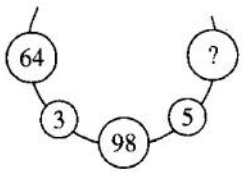
$7 \times 3 = 21$, $6 \times 4 = 24$, $45 \times 2 = 90$

$4 \times 9 = 36$, $3 \times 6 = 18$, $54 \times 2 = 108$

Q. 48 to 50: Direction There is a specific rule in the following arrangement of numbers. Study that rule carefully. According to that rule choose the correct alternative for the questions that follow.



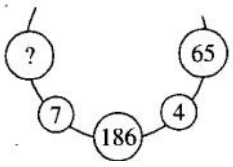
48.



(1) 30 (2) 32 (3) 34 (4) 52

Sol. **(3)**

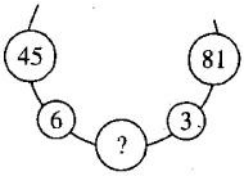
49.



(1) 57 (2) 84 (3) 98 (4) 121

Sol. **(4)**

50.



(1) 216 (2) 126 (3) 113 (4) 93

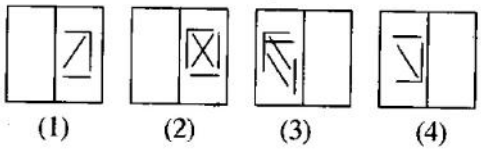
Sol. **(2)**

Q. 51 and 52: Direction In the figure given below, a transparent square shaped paper is folded along the dotted lines, which figure will be obtained? Choose the correct figure from the given alternatives.

51.

Question Figure

Answer Figure



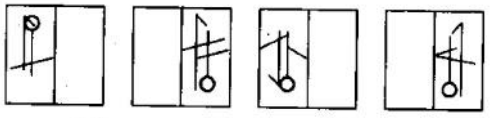
(1) (2) (3) (4)

Sol. **(2)**

52.

Question Figure

Answer Figure



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

Sol. **(4)**

Q. 53 to 55: Direction In each of the following questions there is a specific relationship between the first and the second term. The same relationship exists between the third and the fourth term. Find the relation and choose the correct answer to replace the question mark.

53. KMF : LLH :: RMS : ?

(1) SLR (2*) SLU (3) SSU (4) SUS

Sol. KML : LLH

$K \longrightarrow L$

$M \longleftarrow L$

$F \xrightarrow{(G)} H$

Then,

RMS : _____

$R \longrightarrow S$

$M \longleftarrow L$

$S \xrightarrow{(T)} U$

54. ADE : FGJ :: KNO : ?

(1) PQR (2*) PQT (3) RQP (4) TPR

Sol. ADE : FGJ

DE $\rightarrow$ FG, H I **J**

KNO : PQRST

55. ? : ALKLO :: WOULD : TLRIA

(1) BLOCK (2) BARGE (3) CONES (4*) DONOR

Sol. **WOULD : TLRIA**

$W \xleftarrow{VU} T$

$O \xleftarrow{NM} L$

$U \xleftarrow{TS} R$

$L \xleftarrow{KJ} I$

$D \xleftarrow{CB} A$

Then,
DON OR : ALKLO

$D \xleftarrow{CB} A$

$O \xleftarrow{NM} L$

$N \xleftarrow{ML} K$

$O \xleftarrow{NM} L$

$R \xleftarrow{QP} O$

56. **Direction** In the following question the numbers and letters in each horizontal line are related to each other by a specific rule. Identify the rule and choose the correct alternative to replace the question mark.

FJ	**25**	**16**	**NS**
LZ	**25**	**196**	**SX**
NQ	**?**	**?**	**WY**

(1*) 4, 9 (2) 9. 4 (3) 18, 169 (4) 31, 256

Sol. F J $(6 \sim 10)^2 = 4^2 = 16$
6 10

N S $(14 \sim 19)^2 = 5^2 = 25$
14 19

N Q $(14 \sim 17)^2 = 3^2 = 9$
14 17

W Y $(23 \sim 25)^2 = 2^2 = 4$
23 25

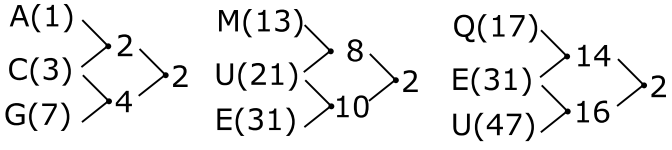
Ans is : NQ 4, 9 WY

57. Choose the correct alternative to replace the question mark.

A	M	Q
C	U	E
G	E	?

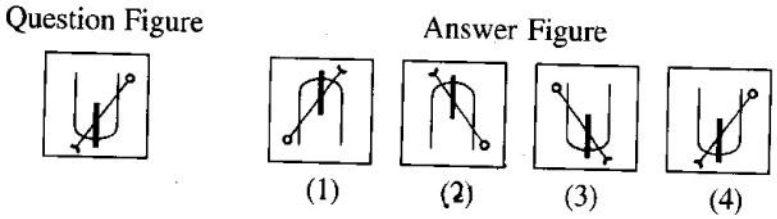
(1) F (2) T (3*) U (4) S

Sol.



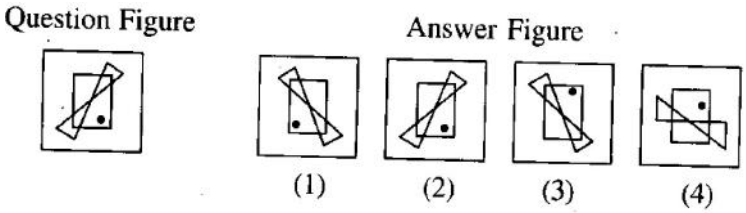
Q.58 and 59: Direction Choose the water image from the alternatives given for the question figure.

58.



Sol **(2)**

59.



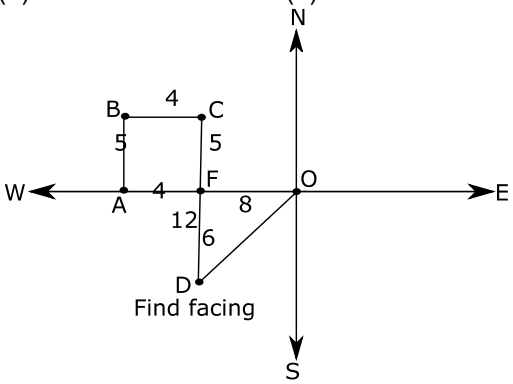
Sol. **(3)**

Q. 60 and 61: Direction Pradyumna walked 12 km west. Then he turned right and walked 5 km. Again he turned right and walked 4 km. Finally he Again turned right and walked 11 km. Then

60. At the end, which direction Pradyumna is facing?

(1) North (2) East (3*) South (4) West

Sol.



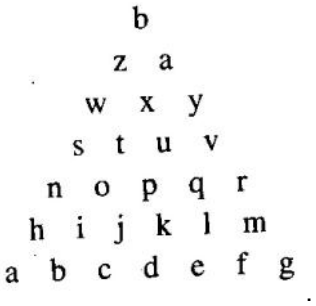
61. At what distance is Pradyumna now from the original place?

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

Sol. In ΔDFO,

$OD \quad \sqrt{6^2 \quad 8^2} \quad \sqrt{100} \quad 10\,km$

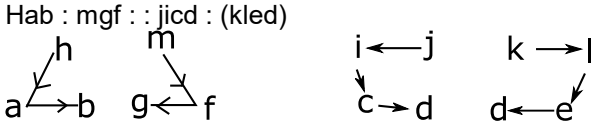
question mark



62. hab : mgf :: jicd : ?

(1*) kled (2) kdel (3) ldek (4) delk

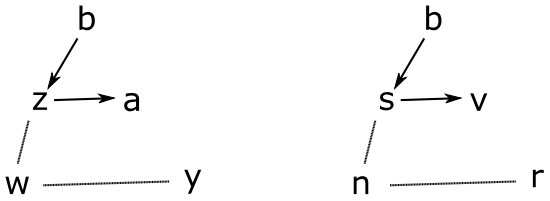
Sol. Hab : mgf : : jicd : (kled)



63. bza : bwy :: bsv : ?

(1*) bnr (2) bvs (3) bhm (4) bag

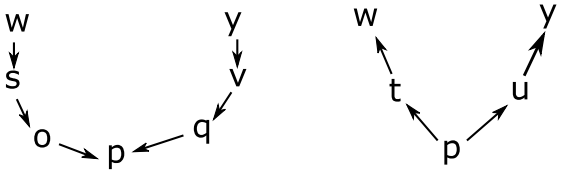
Sol. bza : bwy : : bsv : bnr



64. wsop : yvqp :: ptw : ?

(1) pqr (2*) puy (3) pos (4) pxb

Sol.

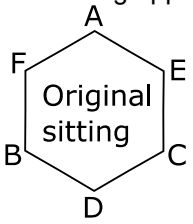


Q. 65 to 67: Direction A, B, C, D, E and F are sitting at each comer of a hexagonal table A and D are facing opposite direction. B is sitting to the left of D. D is sitting next to C and E is sitting to the other side of C.

65. Who is sitting opposite to F?

(1*) C (2) E (3) D (4) B

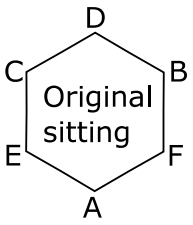
Sol. C is sitting opposite to F



66. If the persons sitting in opposite direction interchange their places, then who will be sitting in between D and F.

(1) E (2) A (3*) B (4) C

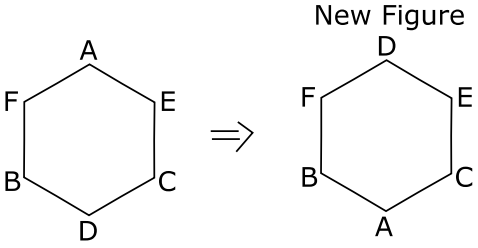
Sol. B is sitting between D & F



67. If only A and D interchange their places who will be in between B and C?

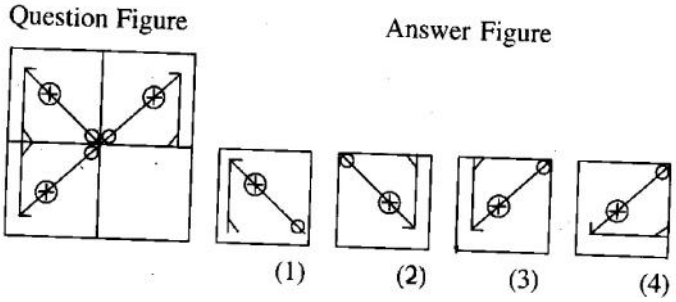
(1*) A (2) F (3) E (4) D

Sol. A is sitting between B & C



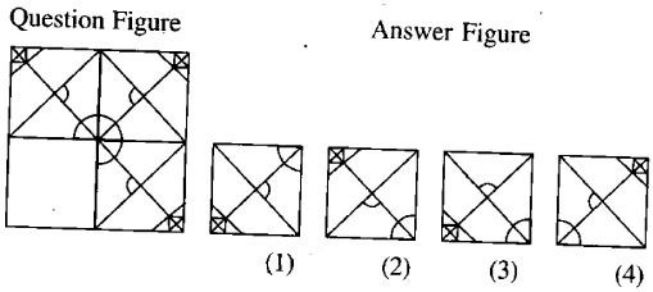
Q. 68 and 69: Direction he following question figure is incomplete. Select the correct alternative that will complete the figure.

68.



Sol. **(2)**

69.



Sol. **(1)**

their ages will be 1:2. Then

70. Find Sunil's present age.

(1*) 14 years (2) 40 years (3) 70 years (4) 28 years

Sol. Sunil age = 'x' yrs
Anil age = 'y' yrs

10 yr Ago : $\frac{x-10}{y-10}=\frac{1}{7}$

10 yr Hence : $\frac{x+10}{y+10}=\frac{1}{2}$

$7x - y = 60$
$2x - y = -10$

$5x = 70$
x = 14

71. What was Anil's age ten years before ?

(1) 4 years (2*) 28 years (3) 24 years (4) 32 years

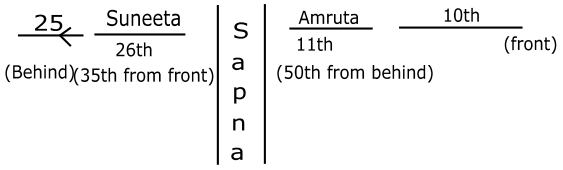
Sol. Sunils Age = 14 yrs. (Present Age)
Anils Age = 38 yrs (Present Age)
10 yrs before Anils Age = 28 yrs

Q. 72 and 73: Direction In a queue, Amruta is at the 11th place from front. Suneeta is at 26th pla from behind. Sapna is at the central place between Amruta and Suneeta. If there are 60 person in the queue, then

72. At which place Sapna is standing from the front?

(1) 12 (2) 24 (3*) 23 (4) 26

Sol.



Position of Sapna is 23 because position of Amruta from behind is 50 position of Suneeta is 35 from front.

73. At which place Sapna is standing from behind?

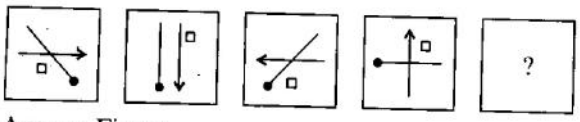
(1) 37 (2*) 23 (3) 23 (4) 39

Sol. (60 – 23) = 37 + 1 = 38

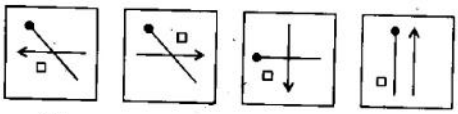
Q. 74 and 75: Direction In each of the following questions the question figures are given in specific order. Select the correct alternative from the answer figures that will replace the question mark.

74.

Question Figure



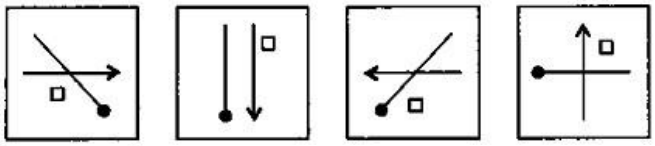
Answer Figure



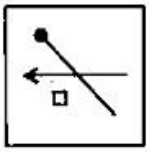
(1) (2) (3) (4)

(1)

Sol.

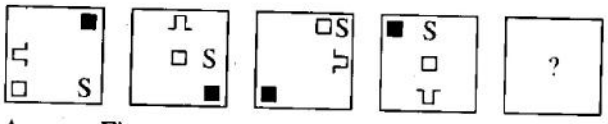


Ans.

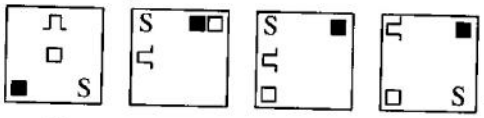


75.

Question Figure



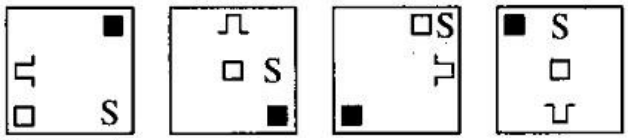
Answer Figure



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

(3)

Sol.



Ans.

(3)

Q. 76 and 77: Direction In the following question in every row the numbers outside the bracket and inside the bracket are related to each other in a specific manner. From the given alternative choose the correct alternative that will replace the question mark

76. 17 (68) 28
11 (22) 14
49 (?) 9
(1) 56 (2) 105 (3*) 147 (4) 63

Sol. 17 (68) $\sqrt{2\times 8} = 17\times 4 = 68$

11 (22) $\sqrt{1\times 4} = 11\times 2 = 22$

49 (?) $\sqrt{9} = 49\times 3 = 147$

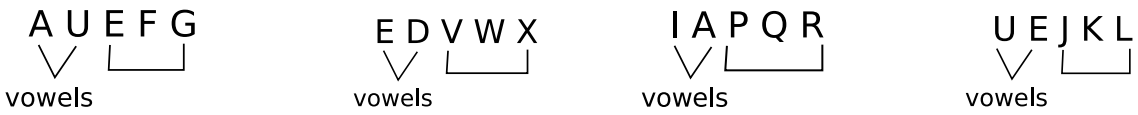
77. 24 (7) 67
53 (6) 25
82 (?) 35
(1) 11 (2) 10 (3*) 9 (4) 8

Sol. $\frac{24+67}{13} = 7, \frac{53+25}{13} = 6, \frac{82+35}{13} = \frac{117}{13} = 9$

Q 78 to 80: Direction In each of the following questions find out the group of letters that matches the given group.

78. AUEFG EOVWX IAPQR
(1) OQRST (2*) UEJKL (3) OKEFG (4) UGHIJ

Sol.



79. ZXAVT WUESQ TRUPN
(1) VTRPN (2) JHFDB (3) LJOHF (4) QOMKI

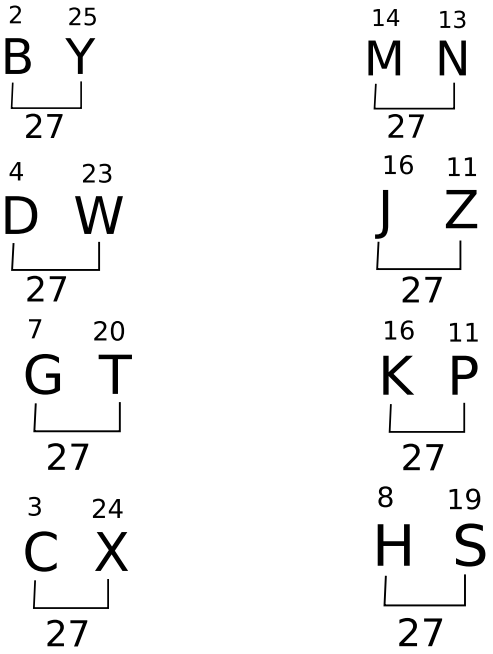
Sol. **(Bonus) DIFFERENCE THREE NOT GIVEN**

26	24	27	22	20
Z	X	A	V	T
23	21	32	19	17
W	U	E	S	Q
20	18	21	16	14
T	R	U	P	N
17	15	WRONG	13	11
Q	O		M	K

80. BYMN DWJZ GTKP

(1) AZFV (2*) CXHS (3) HSOX (4) EVJP

Sol. **FORWARD VALUE** **REVERSE VALUE**



Q. 81 to 83: Direction The word ACTIVE is written in four different code languages. Understanding the code find out the correct code language for the word given in each of the following questions:

ACTIVE = (1) CEVKXG

(2) EFVKYI

(3) XZQFSB

(4) CFXNBL

ACTIVE → (1) C E V K X G → + 2 + 2 + 2……

(2) E F V K Y I → + 4 + 3 + 2 + 2 + 3 + 4

(3) X Z Q F S B → –3, –3, –3……..

(4) C F X N B L → + 2 + 3 + 4 + 5

81. GOLDEN = KRNFHR

Sol. **(2)** GOLDEN = KRNKHR → + 4 + 3 + 2 + 2 + 3 + 4

82. ORANGE = LOXKDB

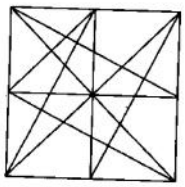
Sol. **(3)** ORANGE = LOXKDB → –3, –3, –3…….

83. PURPLE = RWTRNG →

Q. 84 to 85 : Direction In the given question a complex figure is given. Find out which of the figure given in the alternatives is hidden in the complex figure.

84.

Question Figure



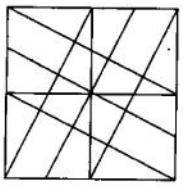
Answer Figure

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

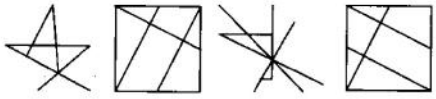
Sol. (1)

85.

Question Figure



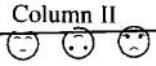
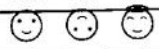
Answer Figure



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

Sol. (2 & 4)

Q. 86 and 87: Direction In the following questions numbers are given in Column I and are coded in column II. But they are not arranged according to the order of digits in the number. Identify the code language and choose the correct alternative to answer the questions:

Column I	Column II
972	
463	
876	
931	
582	

86. Which of the following numbers will be coded as

?

(1) 2165 (2) 2856 (3) 2356 (4) 2534

Sol. (3)

87. Which of the following code will be used to indicate the number 9135?

(1) 

(2) 

(3) 

(4) 

Sol. **(4)**

Q. 88 Direction: Observe the following code and answer the questions that follow :

Letters $\rightarrow$ A T M G O D N R S

Digits $\rightarrow$ 9 8 7 6 5 4 3 2 1

88. Choose the correct code from the following alternatives for the word 'DONAR'.

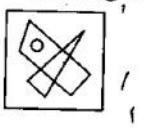
(1) 48391 (2) 54872 (3*) 45392 (4) 53971

Sol. D = 4, O = 5, N = 3, A = 3, R = 2

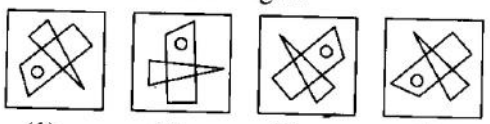
Q. 89 to 90: Direction Choose the correct mirror image from the alternatives given for the question figure.

89.

Question Figure



Answer Figure



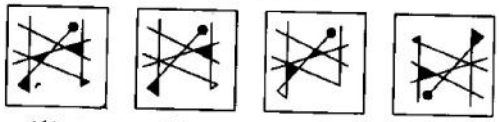
(1) (2) (3) (4)

Sol. **(3)**

90.

Question Figure

Answer Figure



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

Sol. **Bonus** (Figure not matched)

91. In a mathematical code language

$88 - 7 = 39$, $77 - 6 = 41$, $99 - 5 = 74$, then $55 - 4 = ?$

(1) 31 (2*) 39 (3) 49 (4) 34

Sol. $88 - 7^2 = 39$, $77 - 6^2 = 41$, $99 - 5^2 = 74$, $55 - 4^2 = 39$

92. In a mathematical code language

$8 + 6 = 42$, $7 + 5 = 30$, $9 + 3 = 24$, then $6 + 4 = ?$

(1) 27 (2*) 20 (3) 22 ' (4) 24

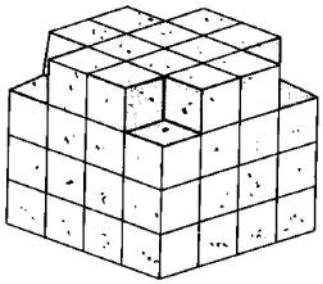
Sol. $8 \times 6 - 6 = 42$

$7 \times 5 - 5 = 30$

$9 \times 3 - 3 = 24$

$6 \times 4 - 4 = 20$

Q. 93 to 95: Direction The following figure is made by arranging some cubes having each side 1 unit. The figure is painted from all the outside surfaces Observe the figure and choose the correct alternative to answer the questions.



93. Maximum how many faces of a cube are painted?

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

Sol. **(2)**

94. How many cubes have at least two faces coloured?

(1) 12 (2) 20 (3) 28 (4) 48

Sol. **(3)**

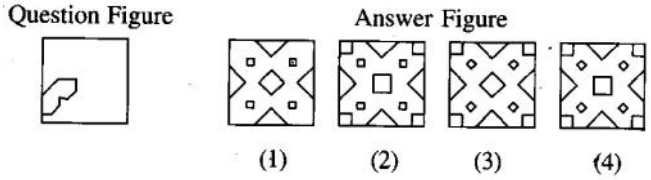
95. How many cubes have only one face painted?

(1) 4 (2) 16 (3) 24 (4) 64

Sol. **(3)**

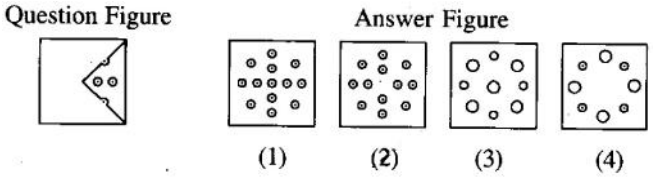
Q. 96 and 97: Direction A square piece of paper is folded and cut at specific spots as shown in the figure. The paper when unfolded will look like as one of the alternative given. Choose the correct alternative.

96.



Sol. **(2)**

97.



Sol. **(2)**

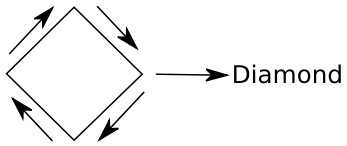
Q. 98 to 100: Direction Observe the following pyramid and choose the correct alternative to answer the questions.

1
2 3
6 5 4
7 8 9 10
15 14 13 12 11
16 17 18 19 20 21
28 27 26 25 24 23 22
29 30 31 32 33 34 35 36
45 44 43 42 41 40 39 38 37

98. 1352 : 13192518 :: 59138 : ?

(1*) 25334132 (2) 25324133 (3) 25413332 (4) 33253241

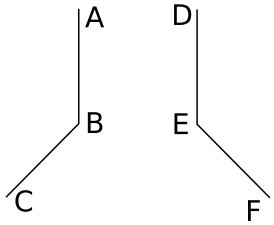
Sol.



99. 163044 : 213538 :: 173143 : ?

(1) 393420 (2*) 203439 (3) 183241 (4) 203440

Sol.



100. 281627 : 222123 :: 292830 : ?

(1) 352236 (2) 353622 (3*) 362235 (4) 363522

Sol.