NATIONAL TALENT SEARCH EXAMINATION-2019-20, PUNJAB

MENTAL APTITUDE TEST (MAT) PAPER & HINTS & SOLUTION

Direction : There is a number series following a pattern. One place is left blank. Find the correct answer from the given options Questions (1-5).

1. 16, 33, 65, 131, _____, 523

(1) 613 (2) 261 (3) 521 (4) 262

Sol. **(2)**

$16 \times 2 + 1 = 33$

$33 \times 2 - 1 = 65$

$65 \times 2 + 1 = 131$

$131 \times 2 - 1 = 261$

2. 15,17,32,49,81,130, _____

(1) 211 (2) 226 (3) 179 (4) 194

Sol. **(1)**

$15 + 17 = 32$

17 + 32 = 49

$32 + 49 = 81$

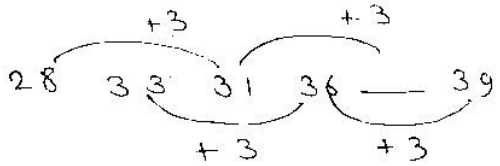
$49 + 81 = 130$

$81 + 130 = 211$

3. 28,33,31,36 _____,39

(1) 40 (2) 38 (3) 32 (4) 34

Sol. **(4)**

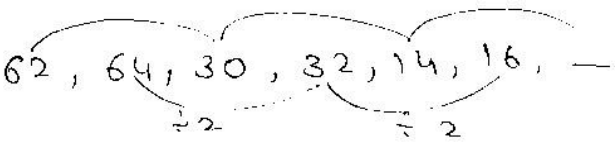


$31 + 3 = 34$

4. 62, 64, 30, 32, 14, 16, _____

(1) 12 (2) 6 (3) 18 (4) 13

Sol. **(2)**



$62 \div 2 - 1 = 30$

$30 \div 2 - 1 = 14$

$14 \div 2 - 1 = 6$

5. 38, 62, 74, 102, _____

(1) 124 (2) 104 (3) 102 (4) 120

Sol. **(2)**

$38+3\times 8=62$

$62+6\times 2=74$

$74+7\times 4=102$

$102+1\times 02=104$

Direction -In question (6-10) find the odd term/wrong term or which is different from the rest three terms.

6. (1) 31:96 (2) 15:63 (3) 22:91 (4) 23.95

Sol. **(1)**

$22\times 4+3=91$

$15\times 4+3=63$

$23\times 4+3=95$

$31\times 4+3=127$

7. (1) DFGE (2) KMNL (3) PRSQ (4) UXWV

Sol. **(4)**

D	F	G	E	K	M	N	L
4	6	7	5	11	13	14	12

P	R	S	Q	U	X	W	V
16	18	19	17	21	24	23	22

UXWV

8. (1) (2,8,18) (2) (7,8,24) (3) (3,9,21) (4) (5,7,19)

Sol. **(2)**

$(2,8,18)$ $2+2\times 8=18$

$(7,8,24)$ $7+2\times 8\neq 24$

$(3,9,21)$ $3+9\times 2=21$

$(5,7,19)$ $5+2\times 7=19$

$7,8,24$

9. (1) CGTX (2) QJUF (3) BFUY (4) DKPW

Sol. **(2)**

10. (1) 65 (2) 344 (3) 730 (4) 101

Sol. **(4)**

$65=4^3+1$ $344=7^3+1$

$730=9^3+1$ $101=10^2+1$

$\therefore (4)101$

Direction: In questions (11-13) the lettei-s/numbers follow a definite pattern. Find the missing letter/number to complete the pattern.

11. _ b c c _ a c _ a a b b _ a b _ c c

(1) bacab (2) bcaca (3) aabca (4) abaca

Sol. **(1)**

_ _ b c c _ a c _ a a b b _ a b _ c c

b b c c a a | c c a a b b | a a b b c c

12. gfe _ 2g _ e22 _ fe2 _ gf _ 22

(1) e2fg2 (2) 2fg2g (3) e2g2e (4) 2fg2e

Sol. **(4)**

gfe _ 2g _ e22 _ fe2 _ gf _ 22

gfe 22|gf e22| gfe22|gfe22

13. 00__0__1__0__0__1

(1) 10010 (2) 01011 (3) 01100 (4) 00111

Sol. **(1)**

0 0 _ 0 _ 1 _ 0 _ 0 _ 1

0 0 1 0 0 1 0 0 1 0 0 1

Direction : Im question (14-16) Developing relationship among items on the left side of sign :: find relationship on the rights side of sign :: by choosing from alternatives.

14. 18 : 48 : : : 100 : ?

(1) 160 (2) 180 (3) 120 (4) 144

Sol. **(2)**

$3^3 - 3^2 = 16$

$4^3 - 4^2 = 64$

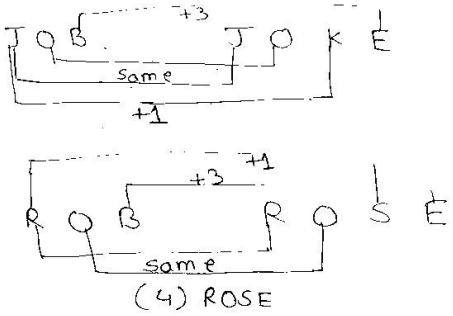
$5^3 - 5^2 = 100$

$6^3 - 6^2 = 180$

15. JOB : JOKE :: ROB : ?

(1) ROBE (2) RODE (3) ROAL (4) ROSE

Sol. **(4)**



16. Tagore : Poetry :: Picasso : ?

(1) Art (2) Literature (3) Painting (4) Architecure

Sol. **(3)**

Tagore : Poetry :: Picasso : painting

Direction -In question (17-23) find the missing term that will come in place of question mark.

17.

372	580	918
235	405	735
274	350	?

(1) 366 (2) 345 (3) 482 (4) 432

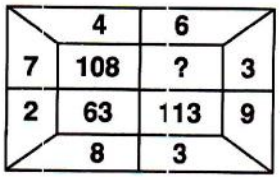
Sol. **(1)**

$(372-235)\times = 274$

$(580-408)\times 2 = 350$

$(918-735)\times 2 = 183\times 2 = 366$

18.



(1) 68 (2) 36 (3) 54 (4) 72

Sol. **(4)**

$4^3+7^2=113$

$2^3+8^2=72$

$3^3+9^2=108$

$6^2+3^3=63$

19.

6	10	?
3	2	2
6	20	4
12	25	64

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

Sol. **(2)**

$\frac{3\times 6\times 12}{6}=6^2$

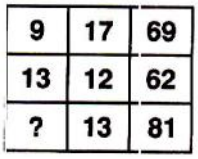
$\frac{2\times 20\times 25}{10}=10^2$

$\frac{2\times 4\times 64}{x}=x^2$

$8^3=x^3$

$8=x$

20.



(1) 5 (2) 9 (3) 21 (4) 10

Sol. **(3)**

$2\times 9+3\times 17=18+51=69$

$2\times 13+12\times 3=26+36=62$

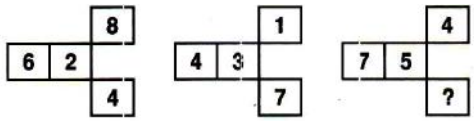
$a\times 2+3\times 13=81$

$a\times 2=81-39$

$a\times 2=42$

$a=21$

21.



(1) 8 (2) 10 (3) 13 (4) 6

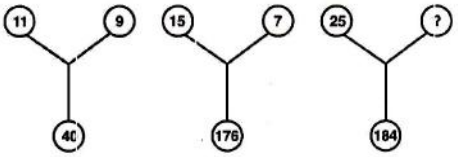
Sol. **(4)**

$6^2-2^2=8\times 4$

$4^2-3^2=1\times 7$

$7^2-5^2=4\times 6$

22.



(1) 24 (2) 22 (3) 21 (4) 19

Sol. **(3)**

$(11+9)(11-2)=40$

$(15+7)(15-7)=176$

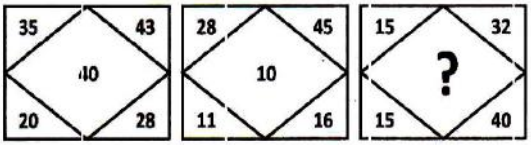
$(25+x)(25-x)=184$

$625-x^2=184$

$625-184=x^2$

$x=21$

23.



(1) 38 (2) 35 (3) 28 (4) 25

Sol. **(1)**

24. If Physics= 106 Then Biology = ?

(1) 90 (2) 92 (3) 82 (4) 87

Sol. **(2)**

PHYSICS

$16+8+25+19+9+3+19+7=99$

BIOLOGY

$2+9+15+12+15+7+25+7=92$

25. If Blue = 160 Then Book = ?

(1) 182 (2) 162 (3) 43 (4) 172

Sol. **(4)**

BLUE

$(2+12+21+5)\times 4=40$

BOOK

$(2+15+15+11)\times 4=72$

Direction: In question (26-27) Find the correct group of signs to solve the Equation.

26. $\sqrt{100} * \sqrt{16} * \sqrt{225} * \sqrt{1}$

(1) x, = ,+ (2) +, =, x (3) +, =, - (4) -, x, =

Sol. **(3)**

27. 24 * 34 * 2 * 5 * 12

(1) +, ÷, ×, = (2) $=,\div,-,+$ (3) $+,\div,=,x$ (4) $=,\div,+,-$

Sol. **(2)**

Direction : in questions (28-31) six children P, Q, R, S, T, U are playing football. P and T are brothers, U is the sister of T,R is the only son of P's uncle , Q and S are the daughters of the only brother of R's father.

28. How is R related to U ?

(1) Brother (2) Cousin (3) Uncle (4) Son

29. How many male players are there?

(1) One (2) Two (3) Three (4) Five

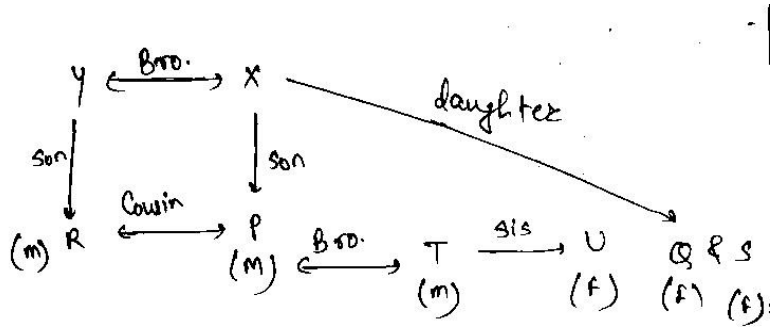
30. How many female players are there?

(1) Four (2) Three (3) Two (4) One

31. How is Q related to P?

(1) Sister (2) Uncle (3) Neice (4) Cousin

Sol. **28 to 31**



28. Sol. (2) Cousin

29. Sol. (3) Three
30. Sol. (2) Three
31. Sol. (1) Sister

32. If "Red" is called "Green"; "Green" is called "Yellow"; "Yellcw" is called ' Violet"; "Violet" is called "Blue"; "Blue" is called "Orange": Then what is the colour of Vegetable Lady finger.
(1) Green (2) Blue (3) Yellow (4) Violet

Sol. (3)

Directions -Questions (33-36) study the columns and answer. In column I some words are given and their codes are given in column II. The codes in the column II are not in the same order as the letter of words in column I

Column I	**Column I**
FLOUR	xncap
TAP	ksd
ROSE	cmrn
LOTUS	smcpx
SAIL	kptm

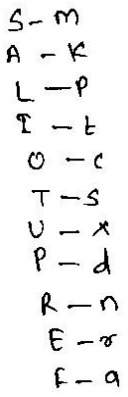
33. Find the code of 'F'
(1) p (2) c (3) x (4) a

34. Find the code for 'P'
(1) d (2) k (3) s (4) c

35. Code of 'Last' word
(1) pkns (2) mcrx (3) pkms (4) pkds

36. What is code ‘PLASTER’ word
(A) dpkxcrn (2) dpkmsrn (3) apxkrnd (4) mrnxpak

Sol. 33 to 36



33. Sol. (4) a

34. Sol. (1) d

35. Sol. (3) pkms

36. Sol. (2) dpkmsrn

37. How many 5's are there in the given number sequence each of which are immediately preceded by 3 or 4 but are not immediately followed by 8 o 9.
3 5 9 5 4 5 5 3 5 8 4 5 6 7 3 5 7 5 5 4 5 2 3 5 1 0
(1) 5 (2) 4 (3) 3 (4) 2
Sol. (1)

38. How many M's occur in the following letter serie which are preceded by 'W' and followed by 'v'
X U V M R S T M W N V M W O P M U V M W A C W M V H P N V M W M T
(1) 3 (2) 1 (3) 2 (4) 5
Sol. (2)

39. Find the word which cannot be formed from the letters of the word 'INFRASTRUCTURE'.
(1) RESTRAIN (2) FRACTURE (3) CHARTER (4) NATURE
Sol. (3)

40. Find the word which can be formed from the letters of the word 'ENVIRONMENT'.
(1) ENVY (2) ENTERTAIN (3) ENTRANCE (4) EMINENT
Sol. (4)

Direction -Read the information carefully and answer the questions (41 to 44) -P, T, V, R, M, D, K and W are sitting around a round table. V is second to left of T, T is fourth to Right of M, D and P are not immediate neighbours of T. D is the third to the right of P. W is not an immediate neighbour of P. P is to the immediate left of K .

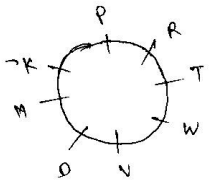
41. Who is second to left of K
(1) R (2) P (3) M (4) W

42. Who is to the immediate left of V
(1) T (2) M (3) D (4) W

43. Who is third to right of V
(1) P (2) R (3) K (4) T

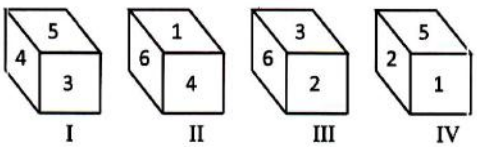
44. What is P's position with respect to V
(1) Fourth to the left (2) Second to the left
(3) Fifth to the right (4) Third to the right

Sol. 41 to 44



41. Sol. R (1)
42. Sol. D (3)
43. Sol. R (2)
44. Sol. (1)

Direction : Questions (45-46) Four positions of the same dice have been shown . Select the alternative which provides correct answer to the question asked.



45. Which number would be Opposite to 3

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

Sol. **(3)**

No. 3 Adjacent no. 5,4,6,2

=1

46. Which number would be opposite to 5

(1) 6 (2) 4 (3) 3 (4) 2

Sol. **(1)**

No. 5 Adjacent no. 4,3,2,1

= 6

47. In a row of twenty five children Gagan is the 14th from the right end. Varun is third to the left of Gagan. What is Varun's position from the left end of the row.

(1) Seventh (2) Tenth (3) Eighth (4) Nineth

Sol. **(4)**

Nineth (4)

48. A person is to climb a tree of 50 feet height. In every second he climbs 5 feet but slips down 4 feet. After how many seconds he will be able to touch the top of tree?

(1) 50 (2) 46 (3) 49 (4) 48

Sol. **(2)**

From the question we understand that in 1 sec he climbs only 1 foot

In 45 sec he climbs 45 feet

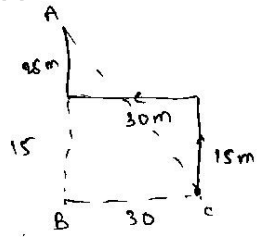
But at 46^{th} sec he jumps first 5 feet and reaches to top = 46

49. Anju walks 15 metres toward north, then she turns left at 90° and walks 30 metres, then turns right at 90° and walks 25 metres. How far is she from the starting point and is in which direction

(1) 50 metres, north-west (2) 50 metres, west

(3) 55 metres, north-east (4) 60 metres, noth

Sol. **(1)**

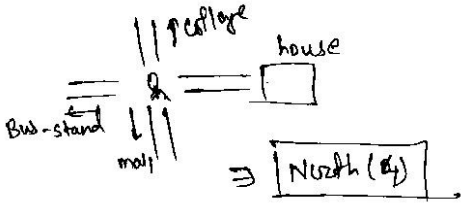


$$(AC)^2 = (AB)^2 + (BC)^2$$

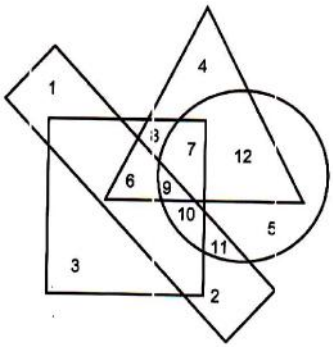
50. Karan wants to go to college which is situated in a direction oppostie to that of a Mall. He starts from his house; which is in the east and comes at a four way place (Churaha). His left side road goes to the Mall and straight in front is the Bus Stand. In what direction is the college located?

(1) North-East (2) South (3) East (4) North

Sol. **(4)**



Direction : In questions (51-54) the following diagrams circle stands for insurance agents, the square stands for hard working, the triangles stands for rural people and rectangle stands for graduates. Based upon these diagrams answer the questions.



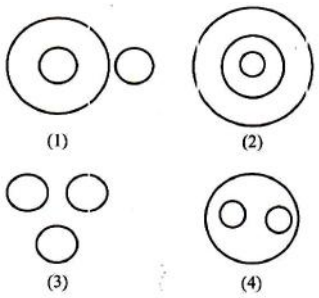
51. Non-rural and hard working Insurance agents who are graduates are indicated by the region
(1) 9 (2) 5 (3) 10 (4) 7
Sol. (3)

52. Insurance agents who are neither graduates nor hard working but rural are represented by the region.
(1) 12 (2) 11 (3) 10 (4) 8
Sol. (1)

53. Hard working non-graduates rural agents are represented by the region
(1) 6 (2) 9 (3) 7 (4) 12
Sol. (3)

54. Non-graduates insurance agents who are not hard working and who do not belong to rural areas are represented by the region
(1) 6 (2) 5 (3) 8 (4) 11
Sol. (2)

Direction : In question (55-57) which of the following diagrams correctly represents the relation between given three items



55. Universe, Earth, Europe
Sol. (2)

56. Door, Window, House
Sol. (4)

57. Radio. T.V., Cinema Hall
Sol. (3)

Direction - In question (58-59) Arrange the words as they occur in the dictionary and choose the correct sequence.

58. (I) Select (II) Seldom
(III) Send (IV) Selfish
(V) Seller
(1) II,V,IV,I, III (2) II,I,V,IV,III (3) I,II,IV,V, III (4) II,I, IV,V,III

Sol. **(4)**

59. (I) Continuation (II) Contention
(III) Contain (IV) Continuous
(V) Count
(1) III,II,I,IV,V (2) III,II,IV,I,V (3) III,II,IV,V,I (4) III,I,II,IV,V

Sol. **(1)**

Direction -Q (60-61) If > denotes +, < denotes -, + denotes $\div$, $\wedge$ denotes x:, - denotes =, x denotes >, = denotes <. Choose the correct statement in each of following questions

60. (1) 14>18+9=16+4<1
(2) 3<6 $\wedge$ 4>25 =8+4>1
(3) 12>9+3<6 $\times$ 25+5>6
(4) 4>3 $\wedge$ 8< 1-6 4-2>24

Sol. **(4)**

$4 > 3 \wedge 8 < 1 - 6 + 2 > 24$

$\Rightarrow 4 + 3 \times 8 - 1 = 6 \div 2 + 24$

$27 = 27$

61. (1) 7 $\wedge$ 7>7+7=7 $\wedge$ 7>1
(2) 7>7<7+7=14
(3) 7<7+7=6
(4) 7+7>7=8

Sol. **(2)**

$7 > 7 < 7 + 7 = 14$

$\Rightarrow 7 + 7 - 7 \div 7 < 14$

$\Rightarrow 13 < 14$

62. A father is three times as old as his son. Five years ago he was four times as old as his son. Find the present age of the son
(1) 17 years (2) 15 years (3) 12 years (4) 19 years

Sol. **(2)**

Let the age of sone be x

Age of father = $3 \times x = 3x$

Before 5 years

Son = $x - 5$

father $= 3x - 5$

from given :

$4(x - 5) = 3x - 5$

$4x - 20 = 3x - 5$

$4x - 3x = -5 + 20$

$x = 15$

63. An ice compartment of a refrigerator is 6 Cm wide and 8 cm deep (long) and 5 cm high. The number of cubes of ice having an edge of 2 cm will there be in the compartment
(1) 80 (2) 30 (3) 24 (4) 20

Sol. **(2)**

6 cm – wide

8 cm – deep

5 cm – high

$\therefore$ total volume = $l \times b \times h$

$= 8 \times 6 \times 5$

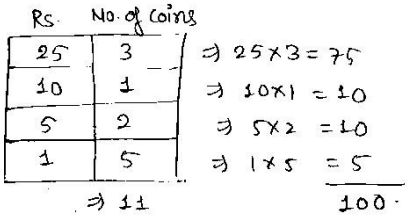
$= 8 \times 30$ = 240 cm

Number of cube of ice = 240 ÷ 8 = 30

64. What is the least number of coins required to make one rupee from different coins of 1,5,10 and 25 paise, so that you have at least one coin of each type

(1) 11 (2) 12 (3) 7 (4) 4

Sol. **(1)**



65. If "STATION MAS TERS MIND THE TRAIN' = 98, Then "SCHOOL MASTERS TRAIN THE MIND " = ?

(1) 96 (2) 85 (3) 99 (4) 72

Sol. **(4)**

STATION – 98 (First word of sentence)

SCHOOL - 72

66. At what time between 4 and 5 O'clock will the minute hand and hour hand of a clock he in opposite direction

(1) 40 minutes past 4

(2) $54\frac{6}{11}$ minutes past 4

(3) 42 minutes past 5

(4) $54\frac{4}{11}$ minutes past 5

Sol. **(2)**

$$360-\left[120-\frac{11x}{2}\right]=180$$

$$180=\frac{11x}{2}-120$$

$$x=54\frac{6}{11}$$

67. The minute hand of a clock overtakes the hour hand at intervals of 65 minutes of the correct time. How much in a day does the clock gain or lose?

(1) Lose $10\frac{10}{143}$ minutes (2) Gain $10\frac{10}{143}$ minutes

(3) Gain $11\frac{10}{143}$ minutes (4) lose $11\frac{10}{143}$ minutes

Sol. **(2)**

By formula

$\left(\frac{720}{11}-m\right)\left(24\times\frac{60}{m}\right)$ mins { here m = difference, m = 65}

$\left(\frac{720}{11}-65\right)\left(24\times\frac{60}{65}\right)$

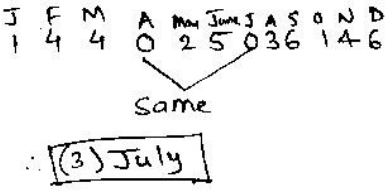
$$= \frac{1440}{143}$$

$$= 10\frac{10}{143}$$

$10\frac{10}{143}$ mins gains

68. Any day in April is always on the same day of the week as the corresponding day in
(1) June (2) December (3) July (4) August

Sol. **(3)**



69. On what dates of August 1980 did Tuesday fall?
(1) 2nd, 9th, 16th , 23rd, 30th (2) 3rd, 10th, 17th 24th, 31st
(3) 4th, 11th, 18th , 25th (4) 5th, 12th, 19th, 26th

Sol. **(4)**

5 August 1980

$$5+3+80+20 = \frac{108}{7} rem 3$$

Code for 3 is Tuesday
5th ,12th , 19th , 26th

70. Teena's income is 25% more than Meena. By what percent Meena's income is less than Teena
(1) 20 (2) 18 (3) 25 (4) 15

Sol. **(1)**

Let meanas income be x

$\therefore$ Teena's income is $\frac{x \times 25}{100} + x = \frac{5x}{4}$

Now,

$$\frac{5x}{4} - x = \frac{x}{4}$$

% Meena's income is less that Teena =

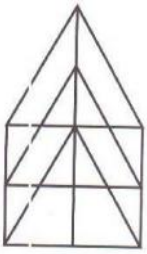
$$\frac{\frac{5}{4}}{\frac{5x}{4}} \times 100 = \frac{100}{5} = 20\%$$

71. Find Correct conclusion from Statements :
(I) Mohit is an artist
(II) Artists are beautiful
Conclusions
(1) Mohit is not beautiful. (2) All beautiful Persons are artists.
(3) Mohit is beautiful. (4) Beantiful Persons are not artists.

Sol. **(3)**

Mohit is beautiful

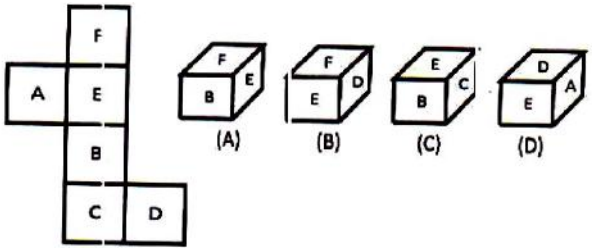
72. How many triangles and Parralelograms are in the given



(1) 21, 17 (3) 19, 13 (3) 19,17 (4) 21, 15

Sol. (3) 19, 17

73. Select from the four alternatives, the box that can be formed by folding the sheet as shown in figure.

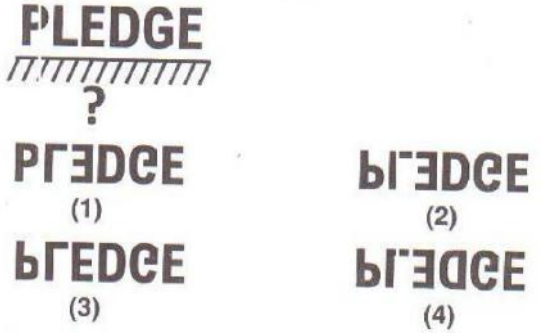


(1) B only (2) A only (3) A and C only (4) A,B,Cand D

Sol. (1)

B only

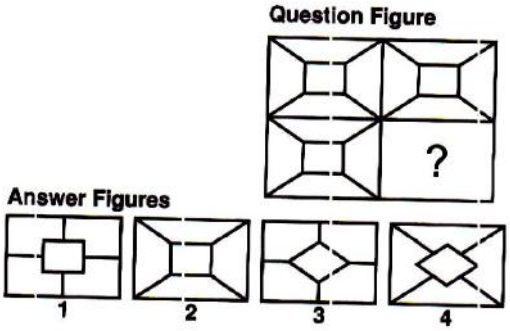
74. Find the Mirror Image of figure



Sol. (3)

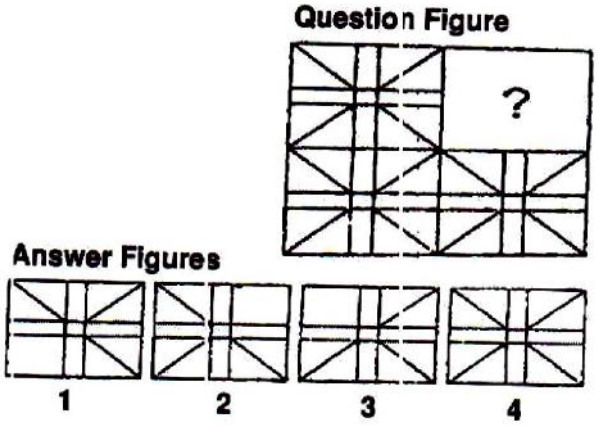
Direction - In questions (75-77) find the correct alternative from the Answer figures to complete the question figures

75.



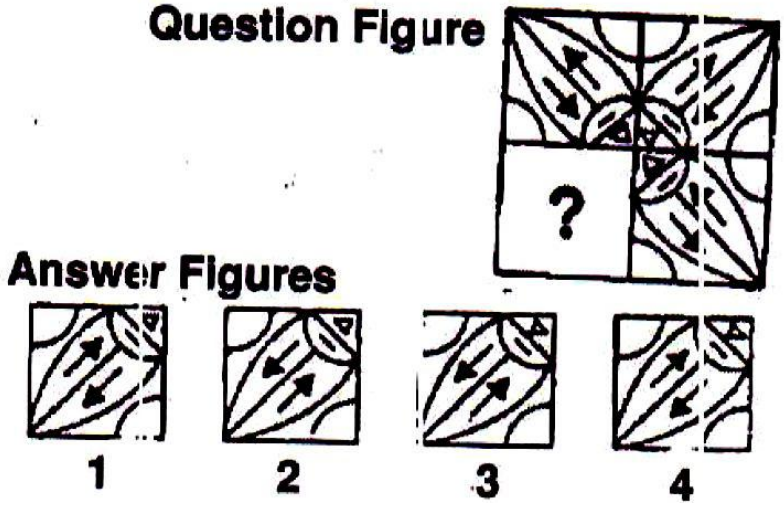
Sol. (2)

76.



Sol. (4)

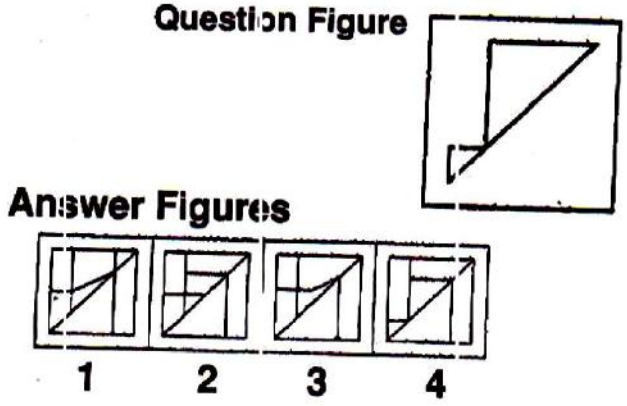
77.



Sol. (4)

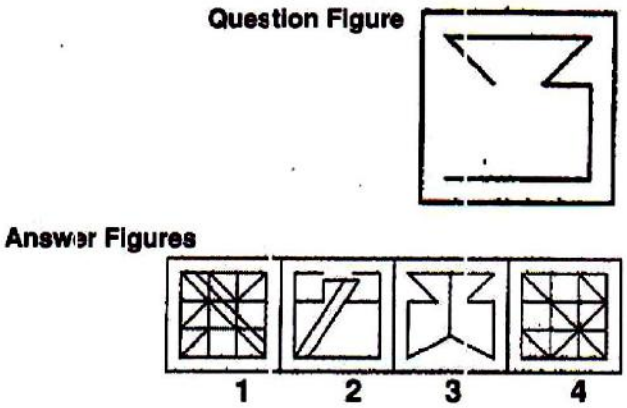
Direction - In questions (78-80), The question figure is embeded in one of the Answer figure. Find the alternative in which it is embeded

78.



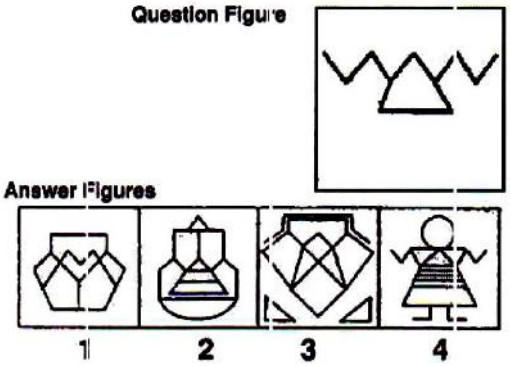
Sol. **(4)**

79.



Sol. **(1)**

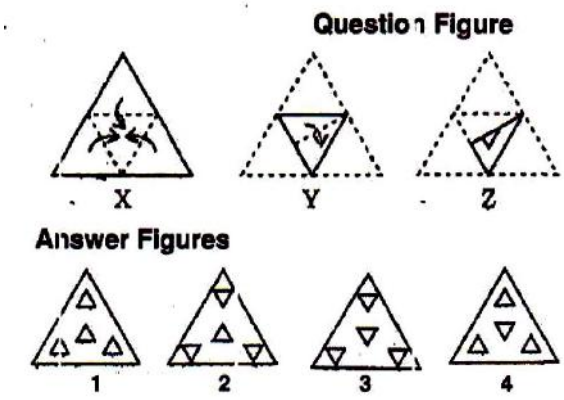
80.



Sol. **(4)**

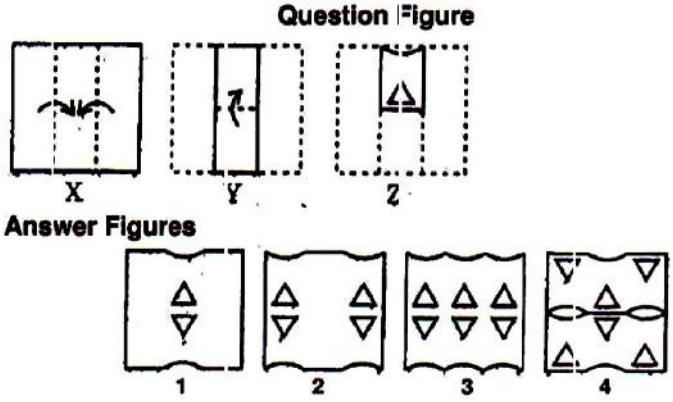
Direction - (Question 81 - 83) Paper is folded as shown with the dotted lines in 'X' & 'Y' and the last figure 'Z' has been cut. How would the paper look like when unfolded.

81.



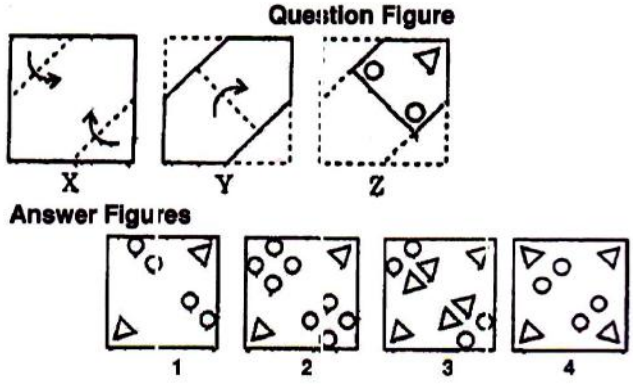
Sol. **(4)**

82.



Sol. (3)

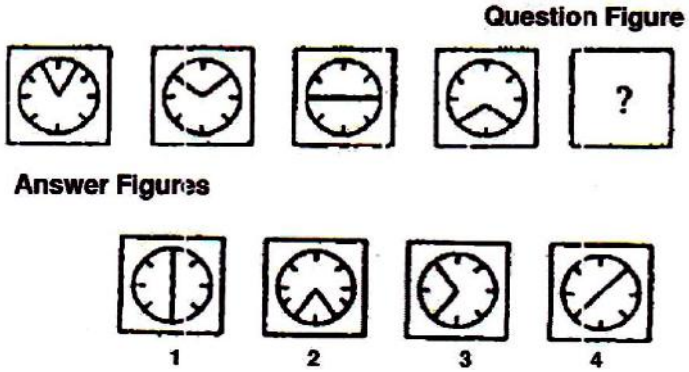
83.



Sol. (2)

Direction - In questions (84-86), which figure among Alternatives, will replace the question mark according to series.

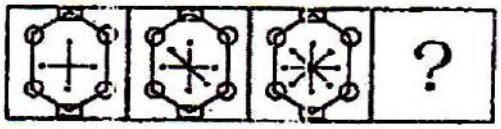
84.



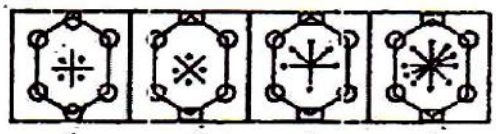
Sol. (2)

85.

Question Figure



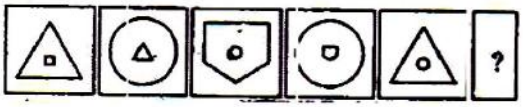
Answer Figures



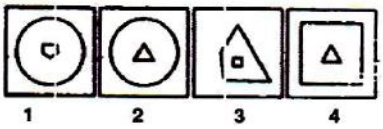
Sol. (4)

86.

Question Figure



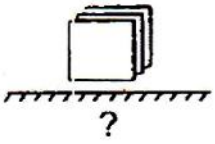
Answer Figures



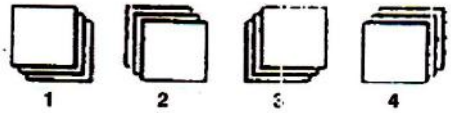
Sol. (2)

87. Direction – First rotate the figure by 90° in clockwise direction and then find out the water Image from the given Alternatives.

Question Figure



Answer Figures

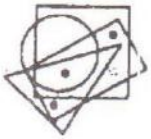


Sol. (4)

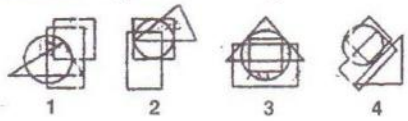
Direction - In questions (88-90) select the alternative which satisfy tie same condition of placement of dots as shown in the figure

88.

Question Figure



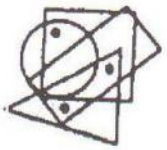
Answer Figures



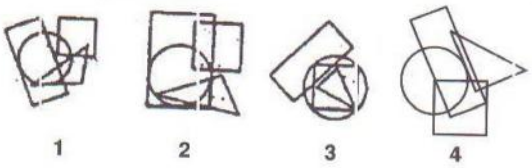
Sol. (1)

89.

Question Figure



Answer Figures

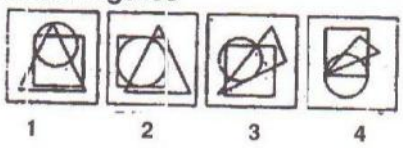


Sol. (4)

90.

Question Figure

Answer Figures

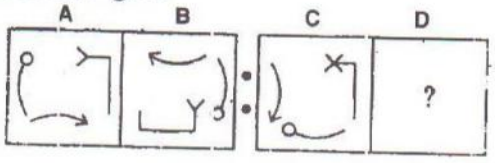


Sol. (1)

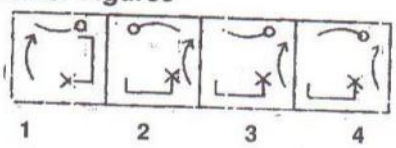
Direction - In question (91-93) figure A and B are related in some Particular Manner. Replace question mark for figure D, by developing same relationship between C and D as is between A & B

91.

Question Figure



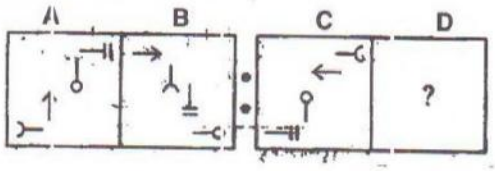
Answer Figures



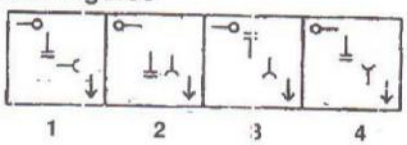
Sol. (4)

92.

Question Figure



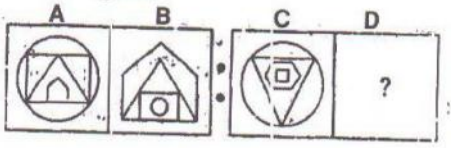
Answer Figures



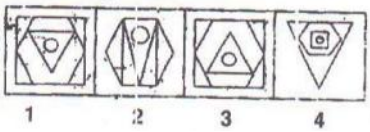
Sol. (3)

93.

Question Figure



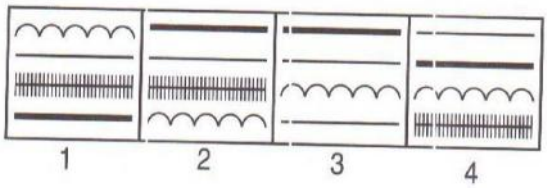
Answer Figures



Sol. (1)

Direction -In questic n (94-95) out of four figures one figure is different, while the others are similar in some way. Find out the different figure.

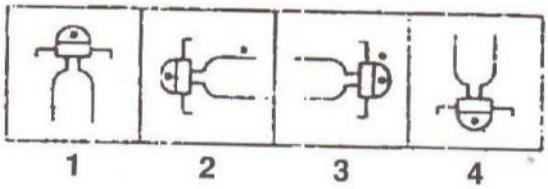
94.



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

Sol. (3)

95.

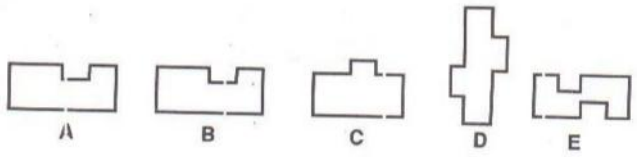


(1) 1 (2) 2 (3) 3 (4) 4

Sol. (4)

Direction - In question (96-97) Five diagrams A,B,C,D,E are given. Three out of these when put together make a square. Find the alternative which one has three such diagrams.

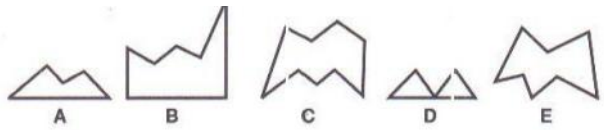
96.



(1) A,B,D (2) A,C,D (3) B,D,E (4) B,C,E

Sol. (1)

97.

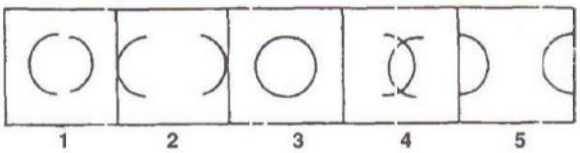


(1) A,B,D (2) B,C,D (3) A,B,C (4) C,D,E

Sol. (2)

Direction- In questions (98-99) if two figures among five figures are interchanged then five figures arranged in certain order. Find among alternatives.

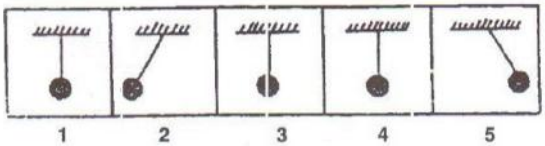
98.



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

Sol. (3)

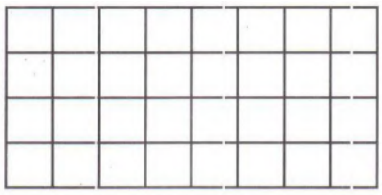
99.



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

Sol. (1)

100. How many squares are in given figure.



(1) 32 (2) 48 (3) 78 (4) 70

Sol. (4)