



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

Date: 6/11/2016

Max. Marks: 50

SOLUTIONS

Time allowed: 45 mins

Direction : (Question number 1 to 5)

1. 37, 511, 713, _____?
(A) 474 (B) 985 (C) 1117 (D) 132

Ans. (C)

Sol. Given series follow a pattern based on prime numbers.

3 & 7, 5 & 11, 7 & 13,...

So next group is 1117

2. 6, 13, _____, 33.
(A) 11 (B) 20 (C) 22 (D) 14

Ans. (C)

Sol. Pattern follows $\begin{matrix} 6, & 13, & 9, & ?, & 33 \\ \square & \square & \square & \square & \square \\ +7 & +9 & & +11 & \end{matrix}$

So, 22 is the missing term

3. _____, 7, 26, 63
(A) 1 (B) 0 (C) 2 (D) 3

Ans. (B)

Sol. Pattern followed is

$1^3 - 1, 2^3 - 1, 3^3 - 1, 4^3 - 1$

So, 0 is the missing term

4. 4, 6, 8, 9, _____.
(A) 11 (B) 12 (C) 13 (D) 10

Ans. (D)

Sol. $\begin{matrix} 4, & 6, & 8, & 9, & 10 \\ \square & \square & \square & \square & \square \\ +2 & +2 & +1 & +1 & \end{matrix}$

5. 12, _____, 56, 78
(A) 34 (B) 35 (C) 23 (D) 13

Ans. (A)

Sol. Pattern followed is

+ 22, + 22, + 22

So, 34 is the missing term

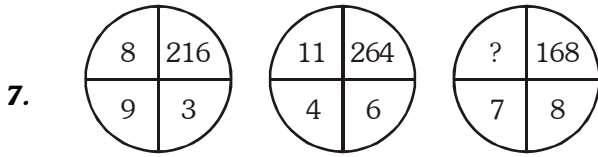
6. If JACK = 25 and QUEEN = 62, what is KING =?
(A) 37 (B) 41 (C) 81 (D) 87

Ans. (B)

Sol. JACK = 10 + 1 + 3 + 11 = 25 (sum of their position value)

∴ KING = 11 + 9 + 14 + 7 = 41

Hence, 41 is the required term



- (A) 4 (B) 3 (C) 42 (D) 21

Ans. (B)

Sol. In fig. 1 - $8 \times 9 \times 3 = 216$
 fig 2 - $11 \times 4 \times 6 = 264$

\therefore In fig. 3 $\frac{168}{7 \times 8} = 3$

Hence 3, is the required term

8. If A = +, B = \div , C = X and D = -, then what is the value of $\frac{1}{5} C 2 B \frac{1}{5} A \frac{1}{5} D \frac{1}{10} = ?$

- (A) 2.1 (B) 1.3 (C) 0.9 (D) 0.5

Ans. (A)

Sol. $\frac{1}{5} \times 2 \div \frac{1}{5} + \frac{1}{5} - \frac{1}{10}$

$$\frac{1}{5} \times 2 \div \frac{1}{5} + \frac{1}{5} - \frac{1}{10}$$

9. The value of $\frac{1}{(216)^{-2/3}} + \frac{1}{(256)^{-3/4}} + \frac{1}{(32)^{-1/5}}$ is

- (A) 102 (B) 105 (C) 107 (D) 109

Ans. (A)

Sol. $\frac{1}{(216)^{-2/3}} + \frac{1}{(256)^{-3/4}} + \frac{1}{(32)^{-1/5}}$

$$\left[\sqrt[3]{216} \right]^2 + \left[\sqrt[4]{256} \right]^3 + \left[\sqrt[5]{32} \right]$$

$$6^2 + 4^3 + 2$$

$$36 + 64 + 2$$

$$102$$

10. $\sqrt[3]{\sqrt{0.000064}} =$

- (A) 0.02 (B) 0.2 (C) 2.1 (D) 3.0

Ans. (B)

Sol. $\sqrt[3]{\sqrt{0.000064}}$

$$= \sqrt[3]{\sqrt{\frac{64}{1000000}}}$$

$$\sqrt[3]{\sqrt{\frac{8}{1000}}}$$

$$= \frac{2}{10} = 0.2$$

11. The value of $\frac{1}{3 + \frac{1}{1 - \frac{1}{6}}}$ is _____.

(A) $\frac{5}{21}$

(B) $\frac{21}{5}$

(C) $\frac{9}{5}$

(D) $\frac{5}{9}$

Ans. (A)

Sol. $\frac{1}{3 + \frac{1}{1 - \frac{1}{6}}}$

$$\frac{1}{3 + \frac{1}{\frac{5}{6}}} = \frac{1}{3 + \frac{6}{5}}$$

$$\frac{1}{\frac{15+6}{5}} = \frac{5}{21}$$

12. If 'n' is a positive integer greater than 3, then $\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right) \dots \dots \left(1 - \frac{1}{n}\right)$ is

(A) $\frac{1}{n}$

(B) $\frac{2}{n}$

(C) $\frac{n-1}{2}$

(D) $\frac{2}{n(n+1)}$

Ans. (B)

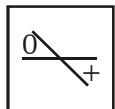
Sol. $\left[1 - \frac{1}{3}\right]\left[1 - \frac{1}{4}\right]\left[1 - \frac{1}{5}\right] \dots \dots \left[1 - \frac{1}{n}\right]$

$$\frac{\cancel{2}}{\cancel{3}} \frac{\cancel{4}}{\cancel{4}} \frac{\cancel{5}}{\cancel{5}} \dots \frac{n-1}{n}$$

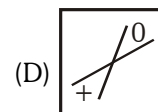
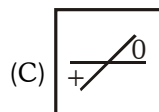
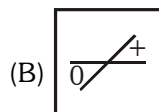
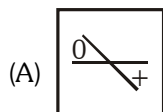
On solving numbers from 3 to n-1, get cancelled

$$\therefore \frac{2}{n}$$

13. A  B



A figure is followed by its four minor images. Select the correct mirror image from the given choices, when a mirror AB is kept above the figure.



Ans. (B)

Sol. By observation

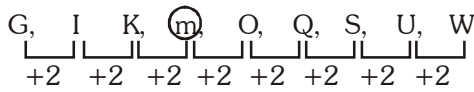
14. Find the missing letter :

G	Q	W
?	I	S
U	O	K

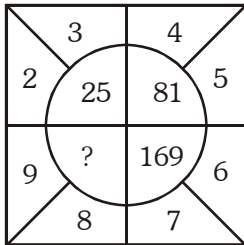
- (A) J (B) V (C) H (D) M

Ans. (D)

Sol. Alphabets used are in +2 pattern



15. Insert the missing number :



- (A) 122 (B) 289 (C) 92 (D) 242

Ans. (B)

Sol. In 1st quadrant $2 + 3 = 5^2 = 25$

2nd quadrant $4 + 5 = 9^2 = 81$

3rd quadrant $6 + 7 = 13^2 = 169$

4th quadrant $8 + 9 = 17^2 = 289$

Direction (Q.16 to 18) : The first two terms are connected by some relationship. The same relationship is applicable for the next two terms, in which one is a blank space. Identify term from the given four alternatives for the blank space.

16. Stag : Fawn :: kangaroo : _____

- (A) Cygnet (B) Joey (C) Infant (D) Foal

Ans. (B)

Sol. Kangaroo : Joey

Joey is a junior Kangaroo

17. Whale : School :: Snake : _____

- (A) Stack (B) Knot (C) Swarm (D) Sheaf

Ans. (B)

Sol. Group of whale is School

Group of Snake is Knot

18. Pathology : Diseases : : Arachnology : _____

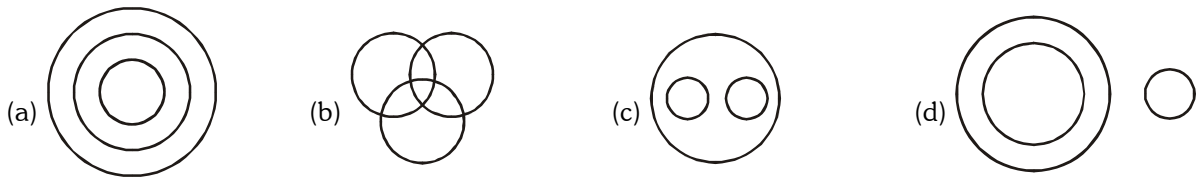
- (A) Beetles (B) Spiders (C) Bees (D) Teddy bear

Ans. (B)

Sol. Arachnology : Spiders.

Arachnology is study of arachnid (Spiders)

Direction (Q.19 to 22) : The following diagrams show some relationship among 3 times. For each group of elements, there corresponds one diagram (a), (b), (c) or (d). Select the suitable diagram



19. Rectangle, Parallelogram, Quadrilateral :

- (A) (a) (B) (b) (C) (c) (D) (d)

Ans. (A)

Sol. All rectangle are parallelogram

All parallelograms are quadrilateral

20. Triangle, Polygon, Circle :

- (A) (a) (B) (b) (C) (c) (D) (d)

Ans. (D)

Sol. All triangle are Polygons

No polygon is circle

21. Vegetables, Fruits, Eatables :

- (A) (a) (B) (b) (C) (c) (D) (d)

Ans. (C)

Sol. All vegetables and fruits are eatables

No vegetables is fruit

22. Natural numbers, whole numbers, integers :

- (A) (a) (B) (b) (C) (c) (D) (d)

Ans. (A)

Sol. All natural numbers are whole, numbers.

All whole numbers are integers

23. In a certain code, LOTUS is written as ULSTO. What will MANGO be written in the code ?

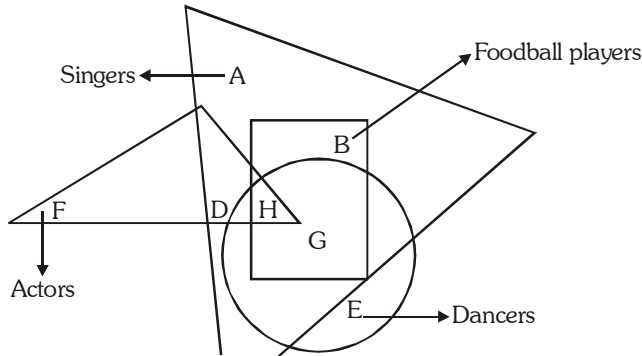
- (A) MOANG (B) GMONA (C) GMAON (D) MGOAN

Ans. (B)

Sol. Shuffling of letters is

LOTUS	ULSTO
1 2 3 4 5	4 1 5 3 2
∴	
MANGO	GMONA
1 2 3 4 5	

Direction (Q.24 to 28) : The following diagram consisting of four overlapping figures, represent four segments of population. The large triangle represent singers, the circle dancers, the rectangle football players and small triangle actors. Study the diagram and answer the questions.



24. Actors and singers but not dancers :

- (A) F and D (B) F, D and H (C) D and H (D) F and H

Ans. (NA)

Sol. Only alphabet D satisfy the given condition.

25. Danvers who are not football players :

- (A) C and E (B) C, E and H (C) C, H and G (D) E Only

Ans. (A)

Sol. By observation

26. Singers who are not dancers :

- (A) A and D (B) A and B (C) A only (D) A, D and B

Ans. (D)

Sol. By observation

27. Football players who are not singers :

- (A) B only (B) H only (C) Nil (D) G only

Ans. (C)

Sol. By observation

28. Name the segment of population which represent all the categories.

- (A) D only (B) C only (C) B only (D) H only

Ans. (D)

Sol. By observation

Direction (Q.29 to 32) : Read the content and answer the given question.

A is shorter than B but taller than C. D is taller than B. E is taller than B but not as tall as D.

29. Who is the tallest of all ?

- (A) A (B) D (C) B (D) E

Ans. (B)

Sol. The arrangement is $D > E > B > A > C$

30. Who is the second tallest ?

- (A) E (B) B (C) D (D) C

Ans. (A)

Sol. The arrangement is $D > E > B > A > C$

31. Who comes middle in the height ?

- (A) C (B) E (C) B (D) A

Ans. (C)

Sol. The arrangement is $D > E > B > A > C$

32. Who is the shortest ?

- (A) A (B) B (C) C (D) D

Ans. (C)

Sol. The arrangement is $D > E > B > A > C$

Direction (Q.33 and 34) : Choose the word which is least like the other words

33. (A) Fungus (B) Medium (C) Strata (D) Terminus

Ans. (C)

Sol. By observation

34. (A) Hen (B) Falcon (C) Bull (D) Jenny

Ans. (D)

Sol. All except Jenny comes under a category of Animals.

35. The unit digit of the number $(986)^{205}$ is :

- (A) 6 (B) 0 (C) 8 (D) 9

Ans. (A)

Sol. $(986)^{205}$

Number at unit place is 6.

So whenever multiply the unit place will remains 6.

36. Find out the word that can be formed by using the letters of the word 'czechoslovakia' using once.

- (A) kiosk (B) zeal (C) cheap (D) larva

Ans. (B)

Sol. ZEAL is only word that can be formed.

37. If $2 * 5 = 4110$, $3 * 7 = 9121$, $5 * 2 = 25110$ then $4 * 8 = ?$

- (A) 32116 (B) 12132 (C) 64112 (D) 16132

Ans. (D)

Sol. $2 * 5 \rightarrow (2^2) 1 (2 \times 5) = 4110$

$3 * 7 \rightarrow (3^2) 1 (3 \times 7) = 9121$

So $4 * 8 \rightarrow (4^2) (1) (4 \times 8) = 16132$

38. The unmatched element of the series is 4, 21, 56, 101, 201.

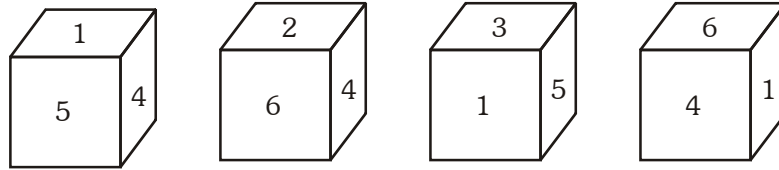
- (A) 4 (B) 101 (C) 56 (D) 21

Ans. (B)

Sol. Diff. of Diff.

4, 21, 56, 101, 201
└─┘ └─┘ └─┘ └─┘
17, 35, 58, 87
└─┘ └─┘ └─┘
18 23 29
└─┘ └─┘
5 6

39. The number opposite to 6 for the following figures is :



- (A) 5 (B) 4 (C) 3 (D) 2

Ans. (A)

Sol. From the given dice

6 is opposite to 5

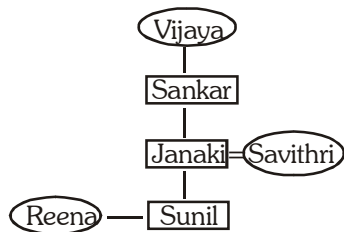
1 is opposite to 2

4 is opposite to 3

40. Reena is Sunil's sister. Janaki is Sunil's mother. Sankar is Janaki's father. Savithri is Janaki's mother. Vijaya is Sankar's mother. How is Reena related to Vijaya ?

- (A) Daughter (B) Grandmother (C) Granddaughter (D) Great granddaughter

Ans. (D)

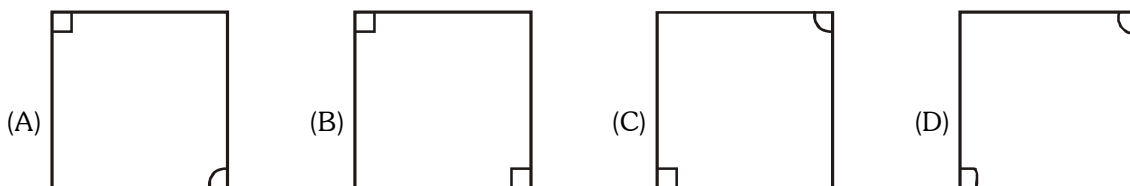
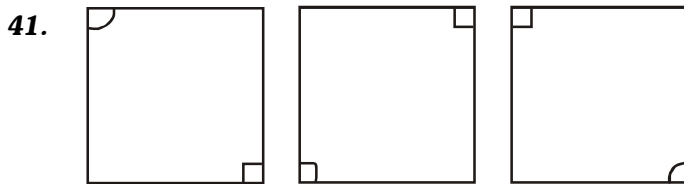


Sol.

Clearly, Reena is Great granddaughter of Vijaya

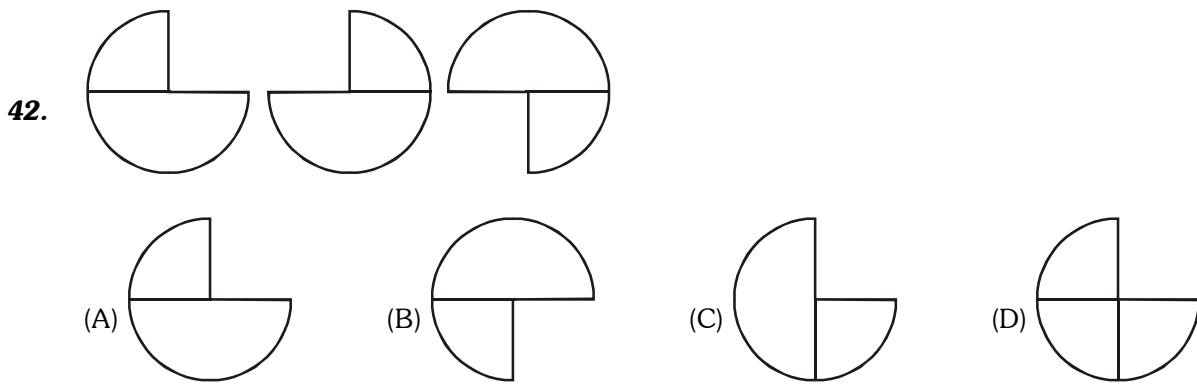
Direction : (Question number 41 to 43)

The next figure in the following sequence of figure is



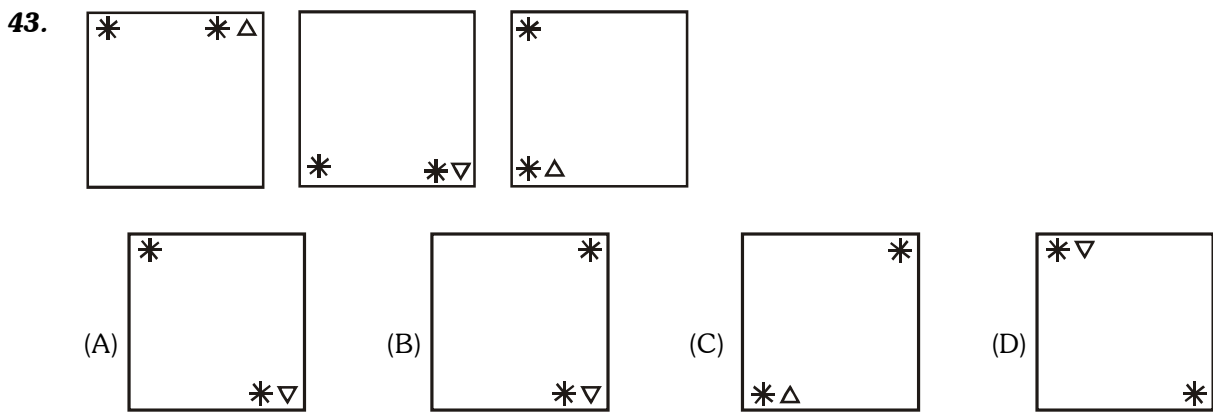
Ans. (C)

Sol. By observation



Ans. (B)

Sol. By observation

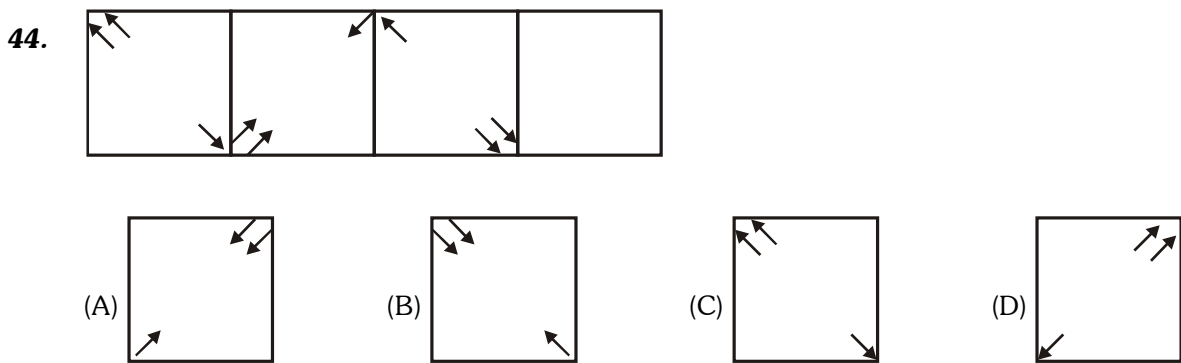


Ans. (B)

Sol. By observation

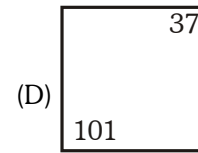
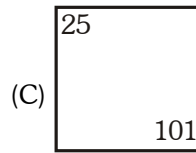
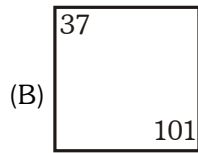
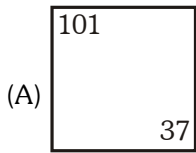
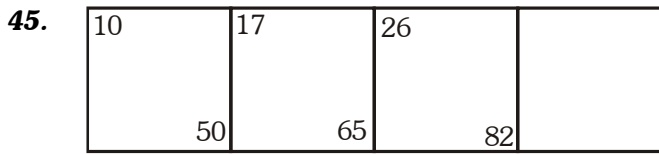
Direction: (Question number 44 to 46)

Choose the missing figure.



Ans. (A)

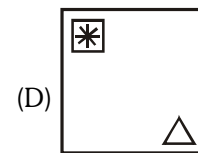
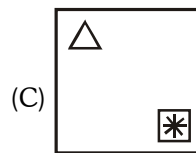
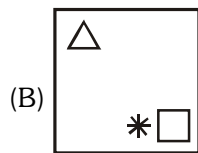
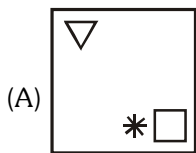
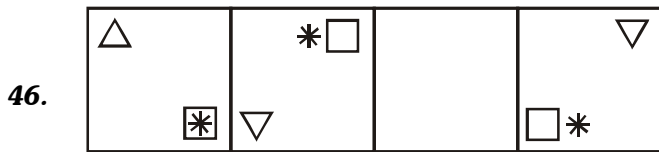
Sol. By observation



Ans. (B)

Sol. Pattern followed

$$\begin{array}{cccc} 50, & 65, & 82, & 101 \\ \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \\ +15 & +17 & +19 & \end{array}$$

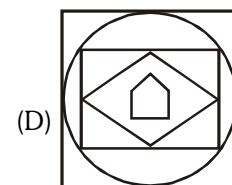
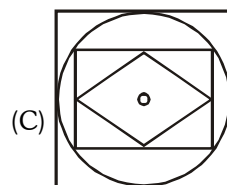
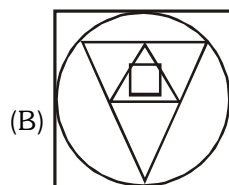
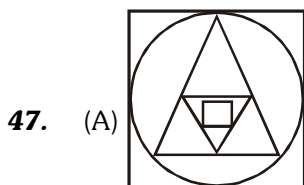


Ans. (D)

Sol. By observation

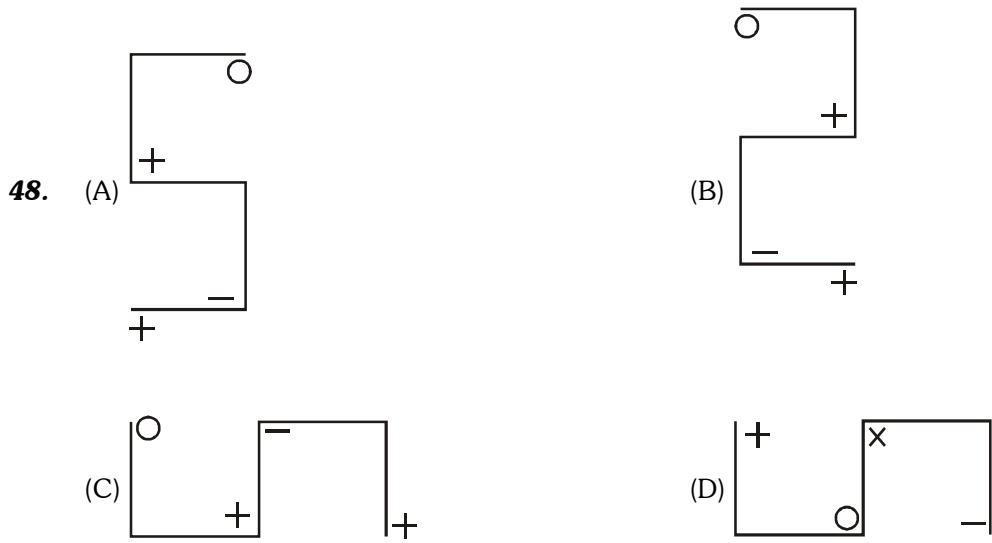
Direction: Question number 47 to 49)

Choose the figure which is different from others.



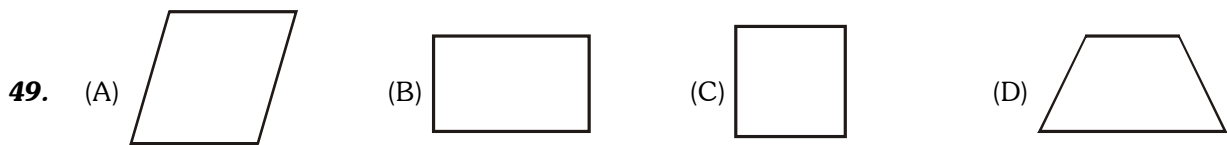
Ans. (C)

Sol. By observation



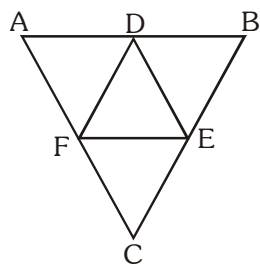
Ans. (D)

Sol. By observation



Ans. (D)

50. ABC is an equilateral triangle. D, E and F are the midpoints of AB, BC and CA respectively, Then, the number of equilateral triangles in the diagram:



(A) 5

(B) 4

(C) 8

(D) 6

Ans. (A)

Sol. ADF, BDE, CDE, DEF, EFC, AEC, are equilateral triangle.