CHAPTER 0 4

FIGURE SERIES COMPLETION

In this chapter a series of figures is given as question figures and the candidates are asked to select one of the figure from the set of answer figures which will continue the given sequence.

You are expected to have a clear vision of different movements and additions/deletions of designs and their rotation.

This type of problem on series consists of three figures forming the set of problem figures followed by four other figures forming the set of answer figures. The students are required to select one of the figure from the set of answer figures which will continue the sequence.

While solving the questions, the students should following points.

Rotational Direction

The rotational direction basically states the clockwise and anti-clockwise directions.



Clockwise movement

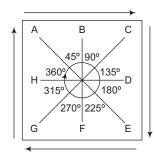


Anti-clockwise movement

Directional Movement of Designs

This provides the knowledge of angular movement of designs in clockwise and anti-clockwise directions.

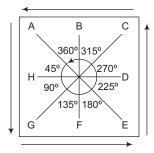
Clockwise Movement



 $\begin{array}{ll} A \rightarrow B = 45^{\circ} \; ; & A \rightarrow C = 90^{\circ} \\ A \rightarrow D = 135^{\circ} \; ; & A \rightarrow E = 180^{\circ} \\ A \rightarrow F = 225^{\circ} \; ; & A \rightarrow G = 270^{\circ} \end{array}$

 $A \rightarrow H = 315^{\circ}$; $A \rightarrow A = 360^{\circ}$

Anti-clockwise Movement



$$A \rightarrow H = 45^{\circ}$$

$$A \rightarrow G = 90^{\circ}$$

$$A \rightarrow F = 135^{\circ}$$

$$A \rightarrow E = 180^{\circ}$$

$$A \rightarrow D = 225^{\circ}$$

$$A \rightarrow C = 270^{\circ}$$

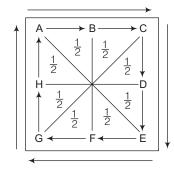
$$A \rightarrow B = 315^{\circ}$$

$$A \rightarrow A = 360^{\circ}$$

Movement of Designs Through Distance

The movement of designs through distance in clockwise and anti-clockwise directions is given below.

Clockwise Movement



$$A \rightarrow B = \frac{1}{2} arm/step;$$

$$A \rightarrow C = 1 \text{ arm/step}$$

$$A \rightarrow D = 1\frac{1}{2} arm/step;$$

$$A \rightarrow E = 2 \text{ arm/step}$$

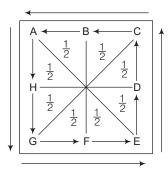
$$A \rightarrow F = 2\frac{1}{2} \text{ arm/step;}$$

$$A \rightarrow G = 3 \text{ arm/step}$$

$$A \rightarrow H = 3\frac{1}{2} \text{ arm/step};$$

$$A \rightarrow A = 4 \text{ arm/step}$$

Anti-clockwise Movement



$$A \rightarrow H = \frac{1}{2} arm/step;$$

$$A \rightarrow G = 1 \text{ arm/step}$$

$$A \rightarrow F = 1 \frac{1}{2} \text{ arm/step;}$$

$$A \rightarrow E = 2 \text{ arm/step}$$

$$A \rightarrow D = 2\frac{1}{2} \text{ arm/step};$$

$$A \rightarrow C = 3 \text{ arm/step}$$

$$A \rightarrow B = 3\frac{1}{2} \text{ arm/step;}$$

$$A \rightarrow A = 4 \text{ arm/step}$$

In this chapter the changes between figures can be based on following

- Based on number of designs
- Based on side of designs
- Based on position of designs
- Based on size and colour of designs

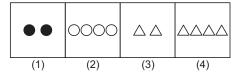
Based on Number of Designs

In this type, the changes occur according to the number of designs. The designs becomes more or less than its previous number of designs.

Example 1. Ques. Figures



Answer Figures



Sol. (4) In each successive figure, one more design is added. Small circle and triangle increases in alternate order. Hence, four triangles will come in fourth figure.

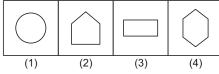
Based on Number of Sides of Designs

In this type, the numbers of sides of design increases or decreases.

Example 2. Ques. Figures



Answer Figures

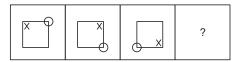


Sol. (2) In each successive figure, one side is increasing. Hence, pentagon will come in fourth figure.

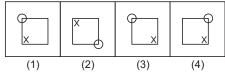
Based on Position of Designs

In this type, designs move from one position to another in a certain fixed pattern.

Example 3. Ques. Figures



Answer Figures



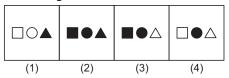
Sol. (1) In each successive figure design (\times) and (O) move one step in clockwise direction.

Based on Size and Colour of Designs

In this type, shaded designs become unshaded and *vice-versa*, small designs becomes larger and *vice-versa* and a new design replaces the other design.

Example 4. Ques. Figures



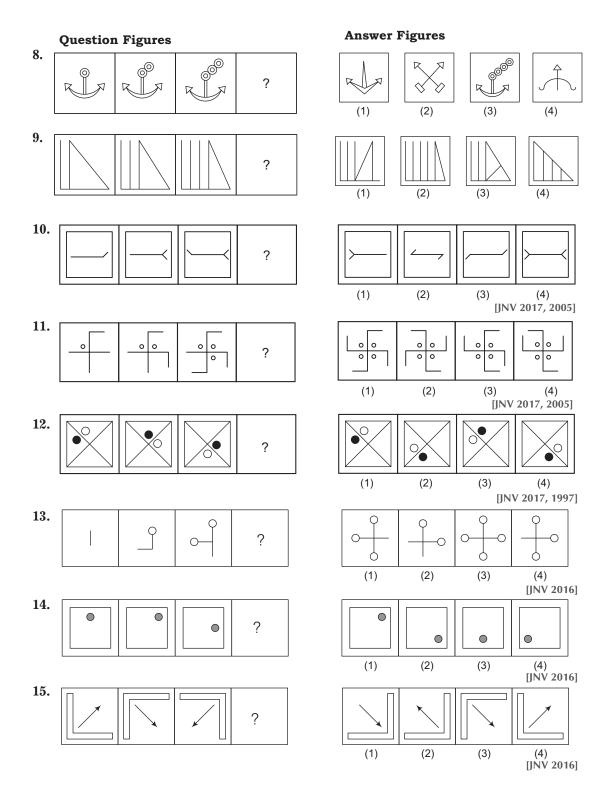


Sol. (2) In each successive figure one more design becomes shaded from the right side.

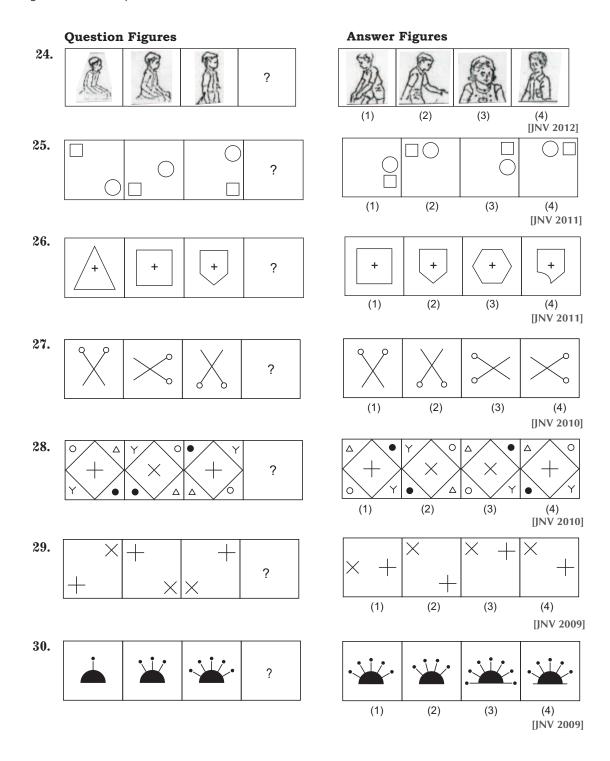
Entrance Corner

Directions (Q. Nos. 1–52) In the following questions, three question figures are given and the space for the fourth place question mark (?). The question figures are in a series. Choose the figure out of the four answer figures marked as 1, 2, 3 and 4 which may complete the series.

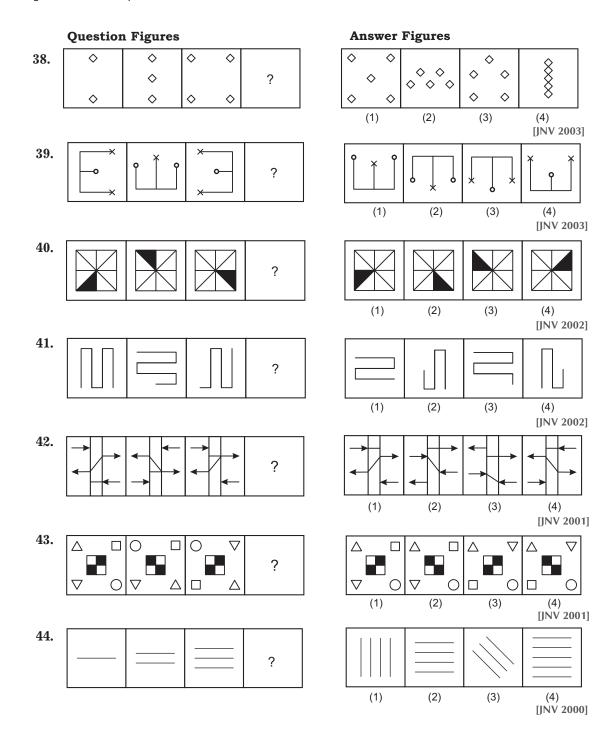
Question Figures Answer Figures 1. ? (3) (1) (2) (4) [JNV 2019] 2. ? (1) (2) (3) [JNV 2019] 3. ? (2) (3) (1) (4) [JNV 2019] ÷ ÷ + $\times | \times$ ÷ 4. ? ÷ + \times (2) (3) (4) [JNV 2019] 5. ? 0 (4) [JNV 2018] 6. ? (1) (2) (3) [JNV 2018] 7. IZPO ZIOP ZPOI ZIPO IPOZ POZI **OZIP** ? (1) (2) (3) (4) [JNV 2018]



Answer Figures Question Figures 16. ? (4) [JNV 2015] (2) (1) (3) 17. ? (2) (3) (4) [JNV 2015] 18. ? (2) (1) (3) (4) [JNV 2015] 19. ? (4) [JNV 2014] (1) (3) (2) 20. ? (4) [JNV 2014] (1) (2) (3) 21. ? (2) (3) (1) (4) [JNV 2013] 22. (4) [JNV 2013] 23. ? (4) [JNV 2012] (1) (2) (3)



Question Figures Answer Figures 31. \bigcirc $\triangleleft \bullet \square$? (1) (2) (3) (4) [JNV 2008] 32. ? (1) (2) (3) (4) [JNV 2008] 33. ? (4) [JNV 2007] (1) (2) (3) **34.** ? (1) (2) (3) (4) [JNV 2007] **35.** ? (4) [JNV 2007] (1) (2) (3) 36. ? (4) [JNV 2004] (1) (2) (3) **37.** ? (1) (2) (3) (4) [JNV 2004]



[JNV 1998]

Question Figures Answer Figures ? (4) [JNV 2000] (1) (2) (3) 46. ? (1) (2) (3) (4) [JNV 1999] 47. 0 ? \bigcirc (1) (2) (3) (4) [JNV 1999] 48. 0 ? 0 0 0 0 0 0 0 0 0 0 (1) (3) (2) (4) [JNV 1999] **49.** N S P R Α ? (1) (2) (3) (4) [JNV 1999] **50.** ? 0 (4) [JNV 1998] (1) (2) (3) **51.** ? (1) (2) (3) [JNV 1998] **52.** ? (1) (2) (3) (4)

Answers

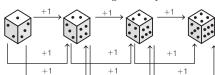
1 (2)	2 (1)	3 (3)	4 (4)	5 (2)	6 (2)	7 (4)	8 (3)	9 (2)	10 (4)
11 (1)	12 (2)	13 (1)	14 (2)	15 (2)	16 (1)	17 (3)	18 (1)	19 (3)	20 (3)
21 (1)	22 (1)	23 (3)	24 (2)	25 (4)	26 (3)	27 (3)	28 (3)	29 (2)	30 (3)
31 (4)	32 (2)	33 (4)	34 (2)	35 (1)	36 (2)	37 (2)	38 (1)	39 (2)	40 (1)
41 (1)	42 (4)	43 (2)	44 (2)	45 (4)	46 (1)	47 (3)	48 (1)	49 (2)	50 (1)
51 (4)	52 (4)								

Hints and **Solutions**

- The elements are moving from one corner to other in clockwise direction in each step. Hence, answer figure (2) will complete the given series.
- 2. One half-leaf is added in each step in clockwise direction. Hence, answer figure (1) will complete the given series.
- 3. The symbols are moving from one side of triangle to other in clockwise direction in each step and the line inside the triangle is same in each alternative figure. Hence, answer figure (3) will complete the series.
- **4.** The symbols are changing their position from one corner to other in anti-clockwise direction in each step. Hence, answer figure (4) will complete the given series.
- **5.** First and third figures are same. So, the fourth figure will be same as second figure.
- In each successive figure, two lines i.e. 'v' are increasing.
- **7.** In each successive figure, the left most letter is shifted to the right most corner.
- **8.** In each successive figure, a symbol ${}^{\backprime} \Theta'$ is increasing.
- In each successive figure, are vertical line is added to the left most corner and triangle becomes smaller.
- 10. One small lines is increasing in each successive figure. Therefore, answer figure (4) will the blank space.
- **11.** One small line and a small circle is increasing in subsequent figures. Therefore, answer figure (1) will occupy the blank space.

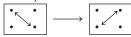
- 12. In each successive figure, circles are moving one block in clockwise direction. Therefore, answer figure (2) will occupy the blank space.
- **13.** In each successive figure one line and one small circle is increasing in the design.
- **14.** In each successive figure shaded circle moves half arm in clockwise direction.
- 15. Each successive figure rotates 90° in clockwise direction to obtain the next figure.
- **16.** In each successive figure designs are moving from one corner to other in clockwise direction.
- **17.** In each successive figure one small circle appears outside the curved line.
- **18.** In each successive figure one small vertical line increases outside the rectangle.
- **19.** In each step, the question figure rotates through 90° clockwise.
- **20.** In each successive figure, a slant line inside the small circle is increasing.
- **21.** In each successive figure, the design rotates 90° in anti-clockwise direction.
- **22.** In each successive figure one upper and lower small rectangle is added.
- **23.** In each step, whole design rotates 90° in clockwise direction.
- **24.** In each step, boy is one step ahead of his previous step.
- **25.** Square is moving 1arm and circle is moving $\frac{1}{2}$ arm in anti-clockwise direction.
- **26.** One line is adding to geometrical design in each step
- **27.** In each step figure rotates 90°clockwise. So, answer figure (3) is the correct answer.

- **28.** In each successive figure middle element rotates 45° clockwise and four corner elements move one position in clockwise direction.
- **29.** In each step, elements are moving from one corner to other in clockwise direction.
- **30.** In each successive figure, two pins are adding at the top of the semicircular.
- **31.** Figure rotates 90° clockwise and in the first figure triangle (Δ) is black, in second figure circle is black and in third figure square is black therefore in fourth figure triangle is black.
- **32.** Shaded part is moving one step anti-clockwise and cross is moving one step clockwise.
- **33.** Arrow is rotating 45°, 90° and then 135°, in clockwise direction, so answer figure is (4).
- **34.** In each step, shaded and unshaded rectangles are added alternatively in a fixed pattern.
- **35.** Black circle moves 1 section, 2 sections and 3 sections in each step.
- **36.** Two lines are adding subsequently in the design.
- **37.** The dice are following below pattern.



38. In each successive figure, one design is increasing.

- **39.** The figure is moving 90° in anti-clockwise direction and elements are inter changing their place in each step.
- **40.** The shaded part is moving three blocks ahead in clockwise direction.
- **41.** The design is moving 90° in clockwise direction and right corner's side is half eliminated.
- **42.** The design rotates 180° and the horizontal line comes upwards.
- **43.** The middle design rotates 90° in each step and the elements at corner changes their position in each alternative step as follow



- **44.** In each successive figure, one line is increasing.
- 45. One line is adding in each subsequent figure.
- **46.** One line is adding at the top of the rectangle subsequently.
- **47.** From first figure to second figure, both the circles change their position, Similarly from third to fourth figure both the circles will change their position.
- **48.** Circles are decreasing by one, subsequently.
- **49.** The series follows below pattern in each step.

$$L \xrightarrow{+2} N \xrightarrow{+2} P \xrightarrow{+2} \boxed{R}$$

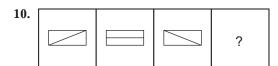
- **50.** The outer most design comes inside in each step.
- **51.** The design is moving 90° in clockwise direction.
- **52.** The first figure is same as the third figure Thus, the answer figure will be same as the second figure.

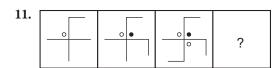
Practice Exercise

Directions (Q. Nos. 1–50) In the following questions three question figures are given and the space for the fourth place has a question mark (?). The question figures are in a series. Choose the figure out of the four answer figures marked as 1, 2, 3 and 4 which may complete the series.

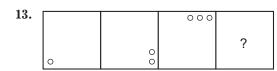
1. Question Figures **Answer Figures** ? (1) (2) (3) (4) ? 3. ? (1) (2) (3)(4) 4. ? (1) (2) (4) (3) **5.** ? (1) (2) (3) (4) ? (1) (2) (3)(4) 7. 0 00 0000 00 0000 00 0 00 0 ? 00 00 00 0 0 00 0 0 00 00 0 (1) (2) (3) (4) 8. ? (1) (2) (3) (4)



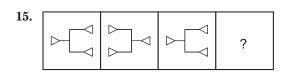


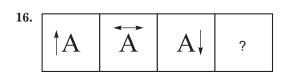


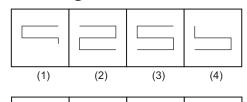


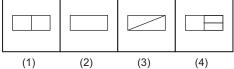


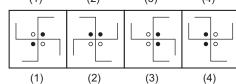


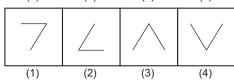




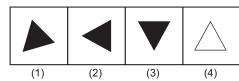


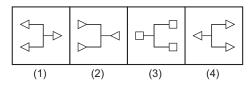


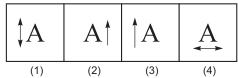


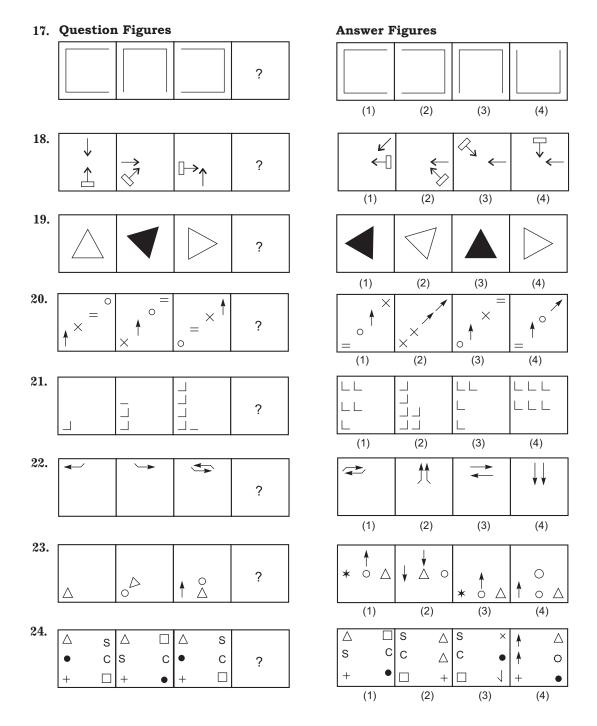


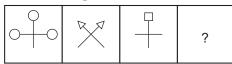


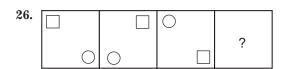


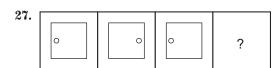


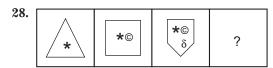


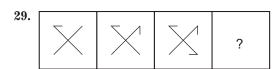


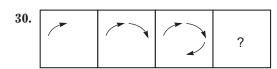




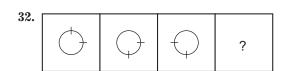


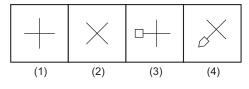


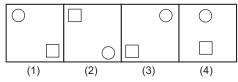


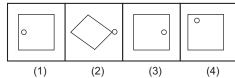


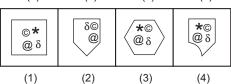


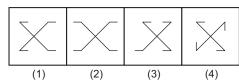


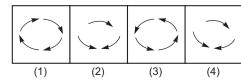


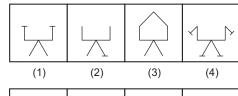


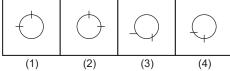


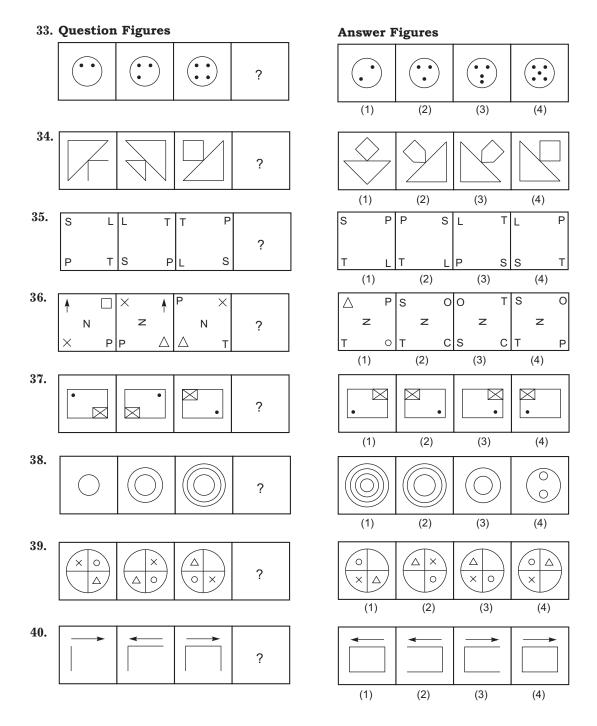


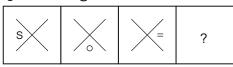




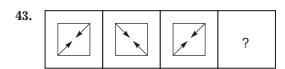


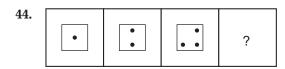




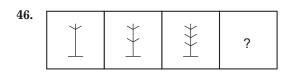


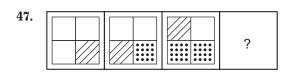
42.

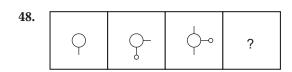


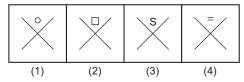


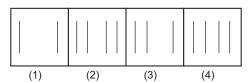


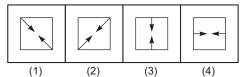


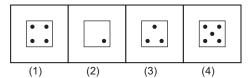


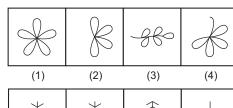


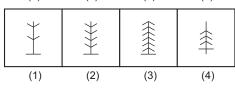


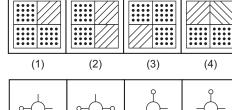








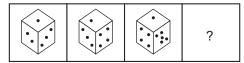




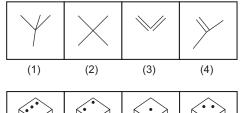
-	· —	<u></u>	<u></u>
(1)	(2)	(3)	(4)

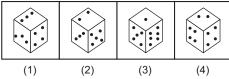






Answer Figures





Answers

1 (2)	2 (1)	3 (2)	4 (1)	5 (2)	6 (2)	7 (2)	8 (2)	9 (3)	10 (1)
11 (1)	12 (2)	13 (1)	14 (2)	15 (2)	16 (4)	17 (4)	18 (3)	19 (1)	20 (1)
21 (2)	22 (1)	23 (3)	24 (1)	25 (2)	26 (3)	27 (3)	28 (3)	29 (4)	30 (1)
31 (2)	32 (1)	33 (4)	34 (3)	35 (2)	36 (1)	37 (1)	38 (1)	39 (4)	40 (1)
41 (2)	42 (2)	43 (1)	44 (1)	45 (2)	46 (2)	47 (1)	48 (4)	49 (2)	50 (3)

Hints and **Solutions**

- In each successive figure, one dot and one line is increasing.
- 2. From first to second figure, the pin at the bottom changes its direction. So, the arrow in third figure will change their position in fourth figure.
- **3.** The design is rotating 90° in anti-clockwise direction
- **4.** Figure 1 is same as figure 3. Thus, the answer figure will be same as the figure 2.
- 5. The design is moving 90° in clockwise direction.
- **6.** In question figures a pattern is being formed in which no line, one line and two lines are drawn from the vertex (vertices) of the square joining the circle. Therefore, answer figure (2) will occupy the blank space.
- The circle is moving in clockwise direction and circle is increasing by one in each successive figures.
- **8.** An arrow on the circle is moving 90° in clockwise direction, while the left side arrow is static on its place.
- **9.** One line is adding in the successive design and forming a new figure.
- 10. The line inside of the rectangle is moving 45° in clockwise direction.

- 11. In question figures one small line and a small unshaded and shaded circle is increasing alternately. Therefore, answer figure (1) will occupy the blank space.
- **12.** The question figure 1 is same as the question figure 3. Thus, the answer figure will be same as the question figure 2.
- **13.** The circle is increasing by one and moving in anti-clockwise direction in successive figure.
- **14.** The question figure 3 is the reverse of the question figure 1. Thus, the answer figure will be the reverse of the question figure 2.
- **15.** The question figure 1 is same as the question figure 3. Thus, the answer figure will be same as the question figure 2.
- **16.** In the question figures 1 and 3, the arrow is changing its place. So, the arrow is question figure 2 will change its Position in answer figure.
- **17.** Question figures 1, 2 and 3 are being turned in clockwise direction. Therefore, answer figure (4) will occupy the blank space.
- **18.** In the figure, the design \uparrow is moving 45° in clockwise direction and \downarrow is moving 90° in anti-clockwise direction.

- **19.** The triangle is rotating 45° in clockwise direction with sequence of white to black.
- **20.** From figure 1 to 2 the signs are exchanging its place in the group of two similar pattern will be followed by third figure to get answer figure.
- **21.** The line is increasing by 3 and 4 in the successive figure.
- **22.** In the question figure 1 and 3, the arrow is inverting and turns perpendicularly.
- 23. All the signs are moving in a proper sequence and a new sign is added at left hand corner each time.
- **24.** The question figure 3 is same as the question figure 1. Thus, the answer figure will be same as the question figure 2.
- 25. The figure and designs are deleted subsequently.
- 26. Both designs are moving from one corner to other in clockwise direction.
- **27.** The sign 'O' is shifted to opposite direction.
- **28.** One line is increasing in geometrical figure and one new design comes inside the geometrical figure.
- **29.** One line is adding in clockwise direction in the design.
- **30.** One curved line is adding in clockwise direction.
- **31.** One line is adding subsequently in the design.
- **32.** Cutting lines of the circle are moving 90° in clockwise direction.
- **33.** The number of black dots are increasing by one in each step.
- **34.** The figure is moving 90° in clockwise direction and a line is added.
- **35.** The latters (S, P, T, L) are moving one side in anti-clockwise direction.

- **36.** In each subsequent figure, the central design rotates 90° on its place and the other designs are moving from one corner to other in clockwise direction and a new design comes buttorn right corner.
- **37.** Two designs (•,⊠) are moving from one corner to other in clockwise direction.
- **38.** In each successive figure one circle increases.
- **39.** The designs are moving 90° in clockwise direction.
- 40. In each successive figure one line is increasing in clockwise direction and the arrow at the top is reserved.
- **41.** Design is moving 90° in anti-clockwise direction and each time a new figure formed.
- **42.** In each step one line is added to the left and right alternatively.
- **43.** The question figure 3 is same as the question figure 1. Thus, the answer figure will be same as the question figure 2.
- 44. Black dot in the square are increasing by one.
- **45.** Petals are increasing by one in the design.
- **46.** In the design, the lines are increasing by two.
- **47.** The design is moving 90° in clockwise direction and one new design with 16 dots is adding.
- **48.** The design is moving 90° in anti-clockwise direction and a new design is adding one by one.
- **49.** One new line is adding in the design to form the sign 'X'.
- **50.** The top face of dice remains same while in other two faces one dot is increasing.

Self Practice

Directions (Q. Nos. 1–24) In the following questions, question figures are given on the left side. These question figures are in a series. Choose the figure out of the answer figures given on the right side which may complete the series.

Question Figures Answer Figures 1. * * * * * * * * * * * * * * * * * * * ? * * * (4) (1) (2) (3) 2. ? (1) (2) (4) (3) 3. ? (1) (2) (3) (4) 4. ? (1) (2) (3) (4) **5.** ? ×× (2) (3) (4) (1) 6. ? (1) (2) (3) (4) 7. 2 2 1 1 ? 2 5 ? (1) (2) (3) (4)

8. Question Figures **Answer Figures** 0 0 ? \bigcirc 0 (4) (1) (2) (3) 9. ? (1) (2) (3) (4) 10. ? (1) (2) (3) (4) 11. ? (1) (2) (3) (4) **12.** \bigcirc ? (1) (2) (3) (4) 13. • (• • • ? (1) (2) (3) (4) 14. ? (1) (2) (3) (4) 15. ? (1) (2) (3) (4) **16.** 0 0 \bigcirc ? 0 \bigcirc 0 \bigcirc (1) (4) (2) (3)

17. Question Figures **Answer Figures** ? (1) (2) (3) (4) 18. ? (1) (2) (3) (4) 19. $\cup \cup \cup$ $\bigcup_{U}\bigcup_{U}\bigcup_{U}$? (3) (4) (1) (2) 20. вĀ A A В Α ? Α Α Α Α Α Α (1) (2) (3) (4) 21. \triangle Δ Δ` Δ ? ΔΔ ΔΔ $\triangle \Delta$ (1) (2) (3) (4) 22. \bigcirc (\circ) ? (1) (2) (3) (4) 23. С D С Χ Χ Υ Υ Ζ Ζ В Α Χ Υ Ζ В С В ? С Χ Ζ Ζ Α Ε Χ (1) (2) (3) (4) 24. \bigcirc ? Δ (1) (2) (3) (4)

(Answers)

1 (2)	2 (3)	3 (1)	4 (3)	5 (2)	6 (1)	7 (1)	8 (1)	9 (3)	10 (4)
11 (1)	12 (2)	13 (1)	14 (3)	15 (1)	16 (4)	17 (1)	18 (1)	19 (4)	20 (2)
21 (2)	22 (4)	23 (1)	24 (1)						