MAHCET Abstract Reasoning
Sample Paper – 8

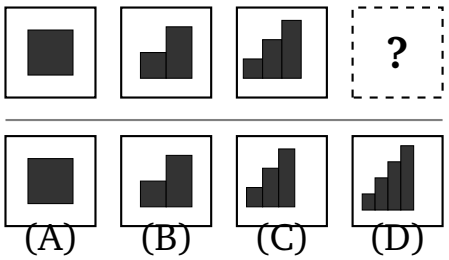
Duration: 19 Minutes **Total Marks:** 25 **Questions:** 25 **Negative Marking:** None

Instructions

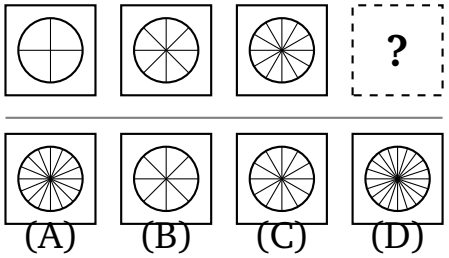
- This paper contains 25 questions from the Abstract Reasoning section of MAHCET.
- Each question carries 1 mark. There is no negative marking for wrong answers.
- All questions are compulsory. Choose the best option from (A), (B), (C), (D).
- This is a Computer Based Test (CBT). No physical calculator is allowed.
- Attempt all questions within the allotted time of 19 minutes.

Abstract Reasoning

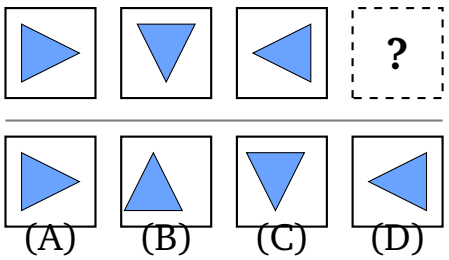
Q1. Find the missing figure in the series.



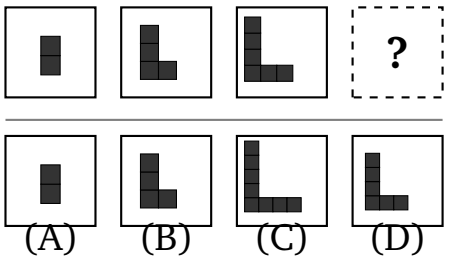
Q2. Find the missing figure in the series.



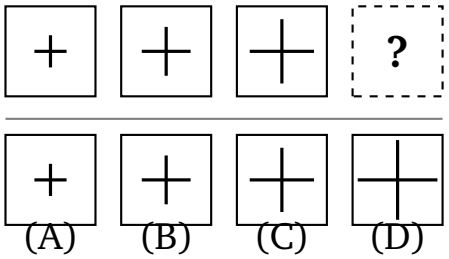
Q3. Find the missing figure in the series.



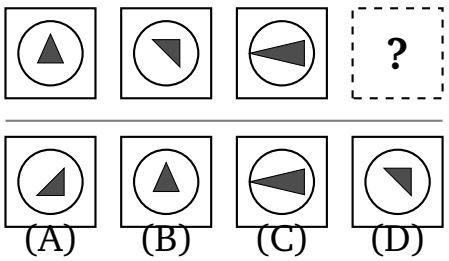
Q4. Find the missing figure in the series.



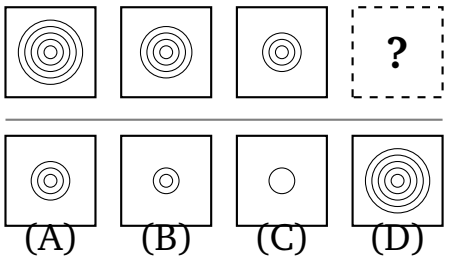
Q5. Find the missing figure in the series.



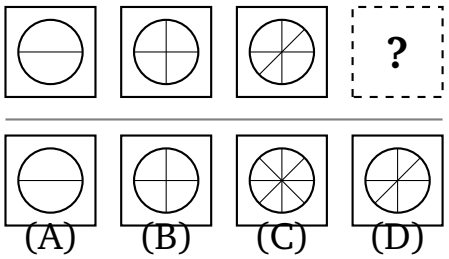
Q6. Find the missing figure in the series.



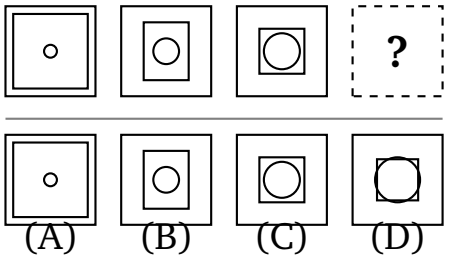
Q7. Find the missing figure in the series.



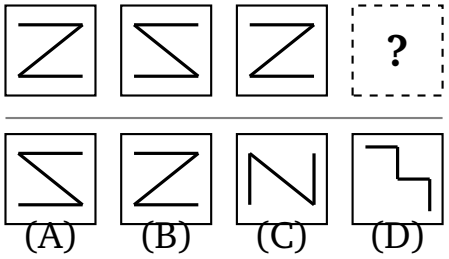
Q8. Find the missing figure in the series.



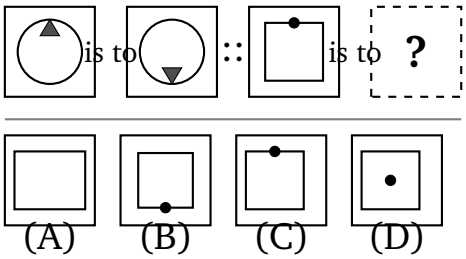
Q9. Find the missing figure in the series.



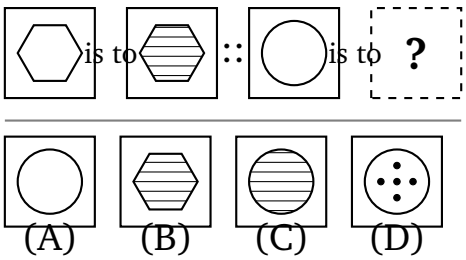
Q10. Find the missing figure in the series.



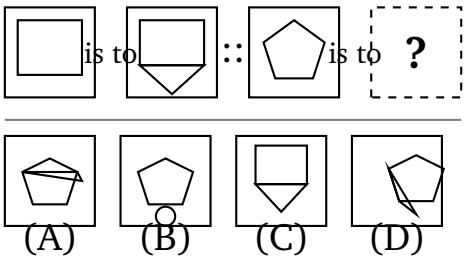
Q11. Choose the figure that completes the analogy.



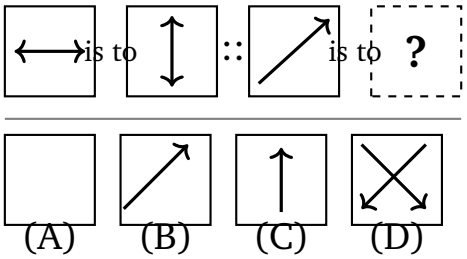
Q12. Choose the figure that completes the analogy.



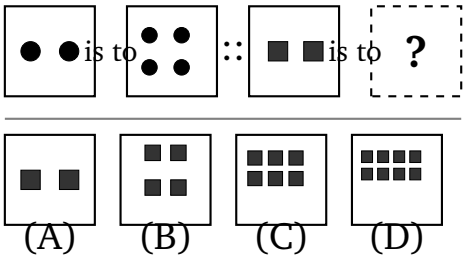
Q13. Choose the figure that completes the analogy.



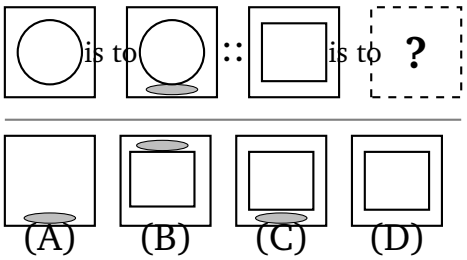
Q14. Choose the figure that completes the analogy.



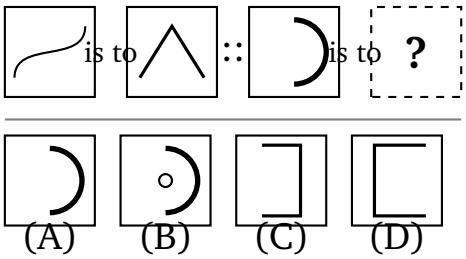
Q15. Choose the figure that completes the analogy.



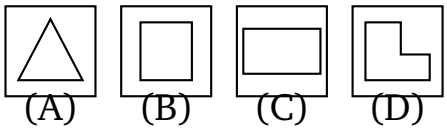
Q16. Choose the figure that completes the analogy.



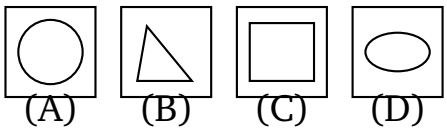
Q17. Choose the figure that completes the analogy.



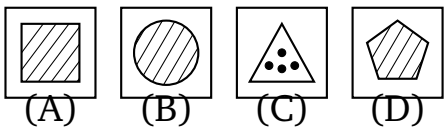
Q18. Which figure does NOT belong to the group?



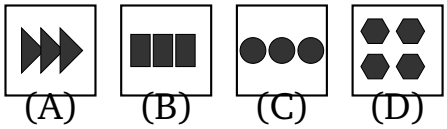
Q19. Which figure does NOT belong to the group?



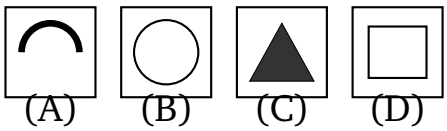
Q20. Which figure does NOT belong to the group?



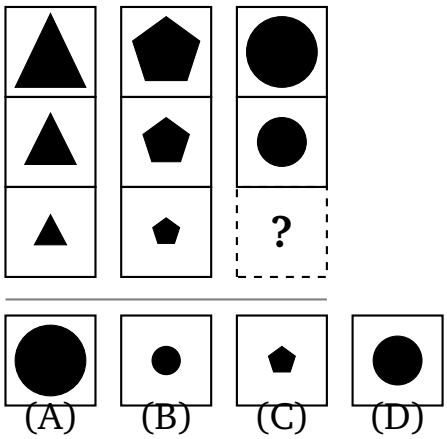
Q21. Which figure does NOT belong to the group?



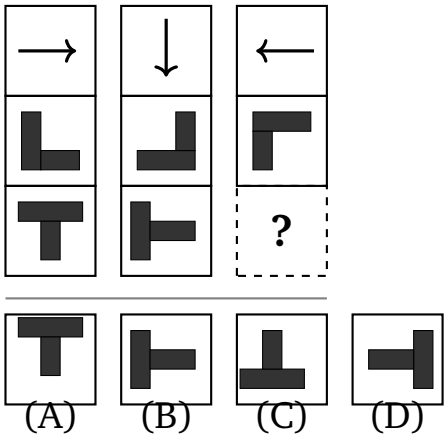
Q22. Which figure does NOT belong to the group?



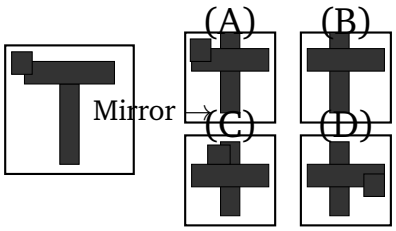
Q23. Find the missing figure in the 3×3 matrix.



Q24. Find the missing figure in the 3×3 matrix.



Q25. Select the correct mirror image of the given figure.



Detailed Solutions

1.

Solution

Concept — Series: Staircase Pattern Growing

Identify the rule: Each frame adds one more step to the staircase: Step 1 = 1-step (1 column), Step 2 = 2-step (2 columns of heights 1 and 2), Step 3 = 3-step (3 columns of increasing height).

Apply the rule: Step 4 must show a 4-step staircase with four columns of progressively increasing height. Only Option D shows this 4-step staircase pattern.

Why other options are wrong:

- Option A: 1-step staircase — matches Frame 1, already used.
- Option B: 2-step staircase — matches Frame 2, already used.
- Option C: 3-step staircase — matches Frame 3, already used.

Final Answer: Staircase grows by 1 step per frame; Step 4 = 4-step staircase. $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q1

2.

Solution

Concept — Series: Increasing Number of Spokes

Identify the rule: The number of spokes (diameters) in the wheel increases by 2 each step: Step 1 = 2 spokes, Step 2 = 4 spokes, Step 3 = 6 spokes.

Apply the rule: Step 4 requires 8 spokes (lines at every 22.5 degrees). Option A shows a circle with 8 evenly spaced spokes.

Why other options are wrong:

- Option B: 4 spokes — matches Frame 2, already used.
- Option C: 6 spokes — matches Frame 3, already used.
- Option D: 10 spokes — skips Step 4 and goes too far.

Final Answer: Spokes increase by 2 per step; Step 4 = 8 spokes (Option A). $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q2

3.

Solution

Concept — Series: Triangle Rotating 90° Clockwise

Identify the rule: The filled triangle rotates 90° clockwise at each step: Frame 1 = pointing right (0°), Frame 2 = pointing down (90° CW), Frame 3 = pointing left (180° CW).

Apply the rule: The next 90° CW rotation from "left" gives "up" (270° CW = pointing upward). Option B shows the filled triangle pointing up.

Why other options are wrong:

- Option A: Triangle pointing right — matches Frame 1 position, already used.
- Option C: Triangle pointing down — matches Frame 2 position, already used.
- Option D: Triangle pointing left — matches Frame 3 position, already used.

Final Answer: Triangle rotates 90° CW each step; Step 4 = pointing up (Option B). $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q3

4.

Solution

Concept — Series: L-pattern Squares Increasing by 2

Identify the rule: The number of small squares arranged in an L-pattern increases by 2 each step: Step 1 = 2 squares, Step 2 = 4 squares, Step 3 = 6 squares.

Apply the rule: Step 4 requires 8 squares arranged in an L-formation (4 along the base + 4 going up). Option C shows 8 squares in the correct L-pattern.

Why other options are wrong:

- Option A: 2 squares — matches Frame 1.
- Option B: 4 squares — matches Frame 2.
- Option D: 6 squares — matches Frame 3.

Final Answer: L-pattern squares increase by 2 per step; Step 4 = 8 squares (Option C). $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q4

5.

Solution

Concept — Series: Plus Sign with Growing Arm Length

Identify the rule: The arm length of the plus (+) sign increases uniformly each step: Step 1 = arm 0.25, Step 2 = arm 0.38, Step 3 = arm 0.50 (increase of ≈0.12–0.13 per step).

Apply the rule: Step 4 requires an even larger plus sign with arm length ≈0.62. Option D shows the extra-large plus sign that extends noticeably beyond the size of Step 3.

Why other options are wrong:

- Option A: Thin plus (arm 0.25) — matches Frame 1.
- Option B: Medium plus (arm 0.38) — matches Frame 2.
- Option C: Larger plus (arm 0.50) — matches Frame 3.

Final Answer: Arm length grows each step; Step 4 = extra-large plus sign (Option D). ⇒ D

Answer: (D) Go Back to Q5

6.

Solution

Concept — Series: Triangle Rotates 45° CCW Inside Circle

Identify the rule: A small filled triangle rotates 45° counter-clockwise inside an outline circle at each step: Frame 1 = pointing up (90°), Frame 2 = pointing upper-left (135°), Frame 3 = pointing left (180°).

Apply the rule: The next 45° CCW rotation from "left" (180°) gives 225° = pointing lower-left. Option A shows the circle with the triangle's apex pointing toward the lower-left direction.

Why other options are wrong:

- Option B: Triangle pointing up — matches Frame 1.
- Option C: Triangle pointing left — matches Frame 3.
- Option D: Triangle pointing lower-right (315°) — wrong direction of rotation.

Final Answer: Triangle rotates 45° CCW each step; Step 4 = pointing lower-left (Option A). ⇒ A

Answer: (A) Go Back to Q6

7.

Solution

Concept — Series: Concentric Circles Decreasing by 1

Identify the rule: One concentric circle is removed per step (from the outermost inward): Frame 1 = 5 circles, Frame 2 = 4 circles, Frame 3 = 3 circles.

Apply the rule: Frame 4 must have 2 concentric circles. Option B shows exactly 2 concentric circles.

Why other options are wrong:

- Option A: 3 circles — matches Frame 3, already shown.
- Option C: 1 circle — skips Step 4 and goes one step further.
- Option D: 5 circles — matches Frame 1, reversal of the pattern.

Final Answer: Circles decrease by 1 per step; Step 4 = 2 concentric circles (Option B). ⇒ B

Answer: (B) Go Back to Q7

8.

Solution

Concept — Series: Circle Divided by Increasing Diameters

Identify the rule: One additional diameter is added to the circle each step: Frame 1 = 1 diameter (2 sections), Frame 2 = 2 diameters (4 sections), Frame 3 = 3 diameters (6 sections).

Apply the rule: Step 4 requires 4 diameters creating 8 equal sections. Option C shows a circle with 4 diameters (H, V, /, \).

Why other options are wrong:

- Option A: 1 diameter — matches Frame 1.
- Option B: 2 diameters — matches Frame 2.
- Option D: 3 diameters — matches Frame 3.

Final Answer: Diameters increase by 1 per step; Step 4 = 4 diameters = 8 sections (Option C). ⇒ C

Answer: (C) Go Back to Q8

9.

Solution

Concept — Series: Outer Shrinks, Inner Grows

Identify the rule: Two simultaneous changes occur: the outer square shrinks progressively AND the inner circle grows progressively. Frame 1 = large square + tiny circle, Frame 2 = medium square + small circle, Frame 3 = small square + medium circle.

Apply the rule: Step 4 must show a tiny outer square + large inner circle (the circle nearly fills the frame). Option D matches this description.

Why other options are wrong:

- Option A: Large square + tiny circle — matches Frame 1.
- Option B: Medium square + small circle — matches Frame 2.
- Option C: Small square + medium circle — matches Frame 3.

Final Answer: Outer shrinks, inner grows each step; Step 4 = tiny square + large

circle (Option D). $\Rightarrow$ D

Answer: (D) Go Back to Q9

10.

Solution

Concept — Series: Alternating Z-shape Reflection

Identify the rule: The Z-shape alternates between its normal orientation and its left-right mirror image (reversed-Z): Frame 1 = Z-normal, Frame 2 = Z-reversed, Frame 3 = Z-normal.

Apply the rule: Frame 4 follows the alternating pattern and must show Z-reversed (same as Frame 2). Option A shows the reversed Z-shape.

Why other options are wrong:

- Option B: Z-normal — matches Frames 1 and 3, not the Step 4 position.
- Option C: N-shape — a different letter/shape entirely, not part of the pattern.
- Option D: S-shape (Z rotated 90°) — a rotation, not the alternating reflection.

Final Answer: Z alternates normal/reversed; Step 4 = Z-reversed (Option A). $\Rightarrow$ A

Answer: (A) Go Back to Q10

11.

Solution

Concept — Analogy: Inner Element Moves from Top to Bottom

Identify the rule: The small inner element moves from the top of the outer shape to the bottom: FigA (circle + triangle at top) → FigB (circle + triangle at bottom). Apply the same rule to FigC (square + circle at top).

Apply the rule: Moving the small filled circle from the top of the square to the bottom gives a square with the circle at the bottom-center. Option B shows this.

Why other options are wrong:

- Option A: Square with no inner element — element removed, not moved.
- Option C: Square with circle at top — same as FigC, no change applied.
- Option D: Square with circle at center — element moved to center, not bottom.

Final Answer: Inner element moves top → bottom; square + circle at bottom (Option B). ⇒ B

Answer: (B) Go Back to Q11

12.

Solution

Concept — Analogy: Adding Horizontal Stripes to Shape

Identify the rule: Horizontal stripes are added inside the plain outline shape: FigA (plain hexagon) → FigB (hexagon with horizontal stripes). Apply the same rule to FigC (plain circle).

Apply the rule: Adding horizontal stripes inside the plain circle gives a circle filled with horizontal lines. Option C shows this striped circle.

Why other options are wrong:

- Option A: Plain circle — same as FigC, no stripes added.
- Option B: Hexagon with stripes — uses wrong outer shape (hexagon instead of circle).
- Option D: Circle with dots — wrong fill pattern (dots instead of stripes).

Final Answer: Horizontal stripes added inside shape; plain circle → striped circle (Option C). ⇒ C

Answer: (C) Go Back to Q12

13.

Solution

Concept — Analogy: Triangle Attached Below Outer Shape

Identify the rule: An outline triangle is attached to the bottom edge of the outer shape (apex pointing down): FigA (plain square) → FigB (square + triangle below). Apply this rule to FigC (plain pentagon).

Apply the rule: Attaching a downward-pointing triangle below the pentagon gives pentagon + triangle below. Option D shows exactly this.

Why other options are wrong:

- Option A: Pentagon + triangle to the right — wrong attachment position.
- Option B: Pentagon + circle attached below — wrong attachment shape.
- Option C: Square + triangle below — correct transformation but wrong outer shape (square instead of pentagon).

Final Answer: Triangle attached below outer shape; pentagon + triangle below (Option D). ⇒ D

Answer: (D) Go Back to Q13

14.

Solution

Concept — Analogy: 90° Clockwise Rotation of Arrow

Identify the rule: The arrow rotates 90° clockwise: FigA (double-headed horizontal ↔) → FigB (double-headed vertical ↕). Apply the same 90° CW rotation to FigC (single arrow pointing upper-right, NE).

Apply the rule: A northeast (↗) arrow rotated 90° CW points toward the southeast (↘, lower-right). Option A shows a bold arrow pointing lower-right (southeast).

Why other options are wrong:

- Option B: Arrow pointing upper-right — same as FigC, no rotation applied.
- Option C: Arrow pointing up — a 90° CCW rotation, not CW.
- Option D: Arrow pointing lower-left — 180° rotation, not 90° CW.

Final Answer: NE arrow rotated 90° CW = SE arrow pointing lower-right (Option A). ⇒ $\boxed{A}$

Answer: (A) Go Back to Q14

15.

Solution

Concept — Analogy: Count Doubles

Identify the rule: The number of shapes doubles: FigA (2 circles) → FigB (4 circles in 2×2). Apply the same doubling to FigC (2 squares).

Apply the rule: Doubling 2 squares gives 4 squares arranged in a 2×2 grid. Option B shows 4 small filled squares in a 2×2 arrangement.

Why other options are wrong:

- Option A: 2 squares — same as FigC, count not doubled.
- Option C: 6 squares — tripled, not doubled.
- Option D: 8 squares — quadrupled, not doubled.

Final Answer: Count doubles; 2 squares → 4 squares in 2×2 (Option B). ⇒ $\boxed{B}$

Answer: (B) Go Back to Q15

16.

Solution

Concept — Analogy: Shadow Added Below Shape

Identify the rule: A gray elliptical shadow is added below the shape: FigA (plain circle) → FigB (circle + shadow below). Apply the same transformation to FigC (plain square).

Apply the rule: Adding a gray shadow below the square gives square + elliptical shadow underneath. Option C shows this correctly.

Why other options are wrong:

- Option A: Shadow only, no square — outer shape removed instead of shadow added.
- Option B: Square + shadow above — shadow placed on wrong side (above instead of below).
- Option D: Plain square — same as FigC, no shadow added.

Final Answer: Shadow added below shape; square + shadow below (Option C). ⇒ C

Answer: (C) Go Back to Q16

17.

Solution

Concept — Analogy: Curved Shape to Angular Equivalent

Identify the rule: The curved shape is replaced by its angular (straight-line) equivalent: FigA (smooth S-curve) → FigB (angular Z-zigzag of 2 lines). Apply to FigC (smooth C-curve / arc opening right).

Apply the rule: The angular equivalent of a C-curve is three connected straight line segments forming an open bracket (two horizontal bars joined by a vertical bar on the left), like the shape ⊂ with right angle corners. Option D shows this angular bracket open to the right.

Why other options are wrong:

- Option A: Smooth C-curve — same as FigC, no angularization applied.
- Option B: C-curve with extra element — modifies rather than angularizes.

- Option C: Angular bracket opening to left — mirror of the correct angular C, wrong orientation.

Final Answer: C-curve → angular bracket (Option D). ⇒ D

Answer: (D) Go Back to Q17

18.

Solution

Concept — Odd One Out: No Right Angle

Identify the rule: Three of the four figures contain right angles: (B) square, (C) rectangle, and (D) L-shape all have 90° corners. Option (A) is an equilateral triangle where all angles are 60°, so it has no right angle.

Apply the rule: The equilateral triangle is the only shape without a right angle, making it the odd one out.

Why other options are wrong:

- Option B: Square — has four right angles, belongs to the group.
- Option C: Rectangle — has four right angles, belongs to the group.
- Option D: L-shape — has six right angles at its corners, belongs to the group.

Final Answer: Equilateral triangle has no right angles (Option A). ⇒ A

Answer: (A) Go Back to Q18

19.

Solution

Concept — Odd One Out: No Horizontal Symmetry

Identify the rule: Three figures are symmetric about a horizontal axis: (A) circle, (C) square, and (D) ellipse all look the same when flipped top-to-bottom. Option (B) is a scalene triangle with vertices at different positions, so it lacks horizontal symmetry.

Apply the rule: The scalene triangle is the only shape that is not symmetric about the horizontal axis, making it the odd one out.

Why other options are wrong:

- Option A: Circle — perfectly symmetric about any axis, belongs to the group.
- Option C: Square — symmetric about H axis, belongs to the group.
- Option D: Horizontal ellipse — symmetric about H axis, belongs to the group.

Final Answer: Scalene triangle has no horizontal symmetry (Option B). $\Rightarrow \boxed{B}$

Answer: (B) Go Back to Q19

20.

Solution

Concept — Odd One Out: Different Fill Pattern

Identify the rule: Three figures use the same diagonal line hatching fill: (A) square with diagonal hatching, (B) circle with diagonal hatching, (D) pentagon with diagonal hatching. Option (C) is a triangle filled with dots — a completely different fill style.

Apply the rule: The triangle with dot fill does not share the diagonal hatching property of the other three shapes.

Why other options are wrong:

- Option A: Hatched square — uses diagonal hatching, belongs to the group.
- Option B: Hatched circle — uses diagonal hatching, belongs to the group.
- Option D: Hatched pentagon — uses diagonal hatching, belongs to the group.

Final Answer: Triangle with dot fill has a different fill pattern (Option C). $\Rightarrow \boxed{C}$

Answer: (C) Go Back to Q20

21.

Solution

Concept — Odd One Out: Different Count of Shapes

Identify the rule: Three figures each contain exactly 3 shapes: (A) 3 triangles, (B) 3 squares, (C) 3 circles. Option (D) contains 4 hexagons arranged in a 2×2 grid.

Apply the rule: Option D has 4 shapes while all others have 3, making it the odd one out regardless of the shape type.

Why other options are wrong:

- Option A: 3 triangles — count = 3, belongs to the group.
- Option B: 3 squares — count = 3, belongs to the group.
- Option C: 3 circles — count = 3, belongs to the group.

Final Answer: 4 hexagons has a different count from the rest (Option D). $\Rightarrow$ D

Answer: (D) Go Back to Q21

22.

Solution

Concept — Odd One Out: Open vs Closed Shape

Identify the rule: Three figures are closed shapes: (B) circle, (C) filled triangle, (D) rectangle — all are closed outlines with no gaps. Option (A) is a semicircular arc that is open at the bottom — it is not a closed shape.

Apply the rule: The open arc does not belong to the group of closed geometric shapes.

Why other options are wrong:

- Option B: Circle — closed shape, belongs to the group.
- Option C: Filled triangle — closed shape, belongs to the group.
- Option D: Rectangle — closed shape, belongs to the group.

Final Answer: The arc is an open (non-closed) shape (Option A). $\Rightarrow$ A

Answer: (A) Go Back to Q22

23.

Solution

Concept — Matrix: Shape Type $\times$ Size

Identify the rule: Two simultaneous rules govern the matrix: rows control size (Row 1 = large, Row 2 = medium, Row 3 = small) and columns control shape type (Col 1 = triangle, Col 2 = pentagon, Col 3 = circle). All shapes are solid filled black.

Apply the rule: Cell (3,3) is in Row 3 (small) and Column 3 (circle), so the missing figure is a small filled circle. Option B matches.

Why other options are wrong:

- Option A: Large filled circle — wrong size (Row 1 size, not Row 3).
- Option C: Small filled pentagon — wrong shape (Col 2 shape, not Col 3).
- Option D: Medium filled circle — wrong size (Row 2 size, not Row 3).

Final Answer: Row 3 = small, Col 3 = circle; missing = small filled circle (Option B). $\Rightarrow$ B

Answer: (B) Go Back to Q23

24.

Solution

Concept — Matrix: Shape Rotates 90° CW across Columns

Identify the rule: Columns control rotation (Col 1 = 0°, Col 2 = 90° CW, Col 3 = 180° CW). Each row uses a different shape type (Row 1 = arrows, Row 2 = L-shapes, Row 3 = T-shapes).

Apply the rule: Cell (3,3) is in Row 3 (T-shape) and Column 3 (180° CW rotation). A T-shape rotated 180° CW becomes an inverted T (⊥) with the stem pointing up and the horizontal bar at the bottom. Option C shows this correctly.

Why other options are wrong:

- Option A: T normal (0° — stem down) — matches Column 1 rotation.
- Option B: T rotated 90° CW (stem right) — matches Column 2 rotation.
- Option D: T rotated 270° CW (stem left) — exceeds 180°, wrong rotation.

Final Answer: Row 3 T-shape rotated 180° CW = inverted T (Option C). ⇒ C

Answer: (C) Go Back to Q24

25.

Solution

Concept — Mirror Image: Left-Right Reflection of Asymmetric T

Identify the rule: A left-right mirror image flips the figure horizontally about the vertical axis. The original figure is a T-shape with a small extra square on the LEFT side of the horizontal bar — this asymmetric element makes the mirror image distinguishable. After left-right reflection, the extra square moves to the RIGHT side.

Apply the rule: In the mirror image, the T-shape remains (vertical and horizontal bars), but the extra small square appears at the RIGHT end of the horizontal bar. Option D shows this correctly.

Why other options are wrong:

- Option A: T with extra square on LEFT — same as the original, not its mirror.
- Option B: T only with no extra square — element removed, not reflected.

- Option C: T with extra square at wrong position (top-center) — incorrect placement of element.

Final Answer: Mirror moves extra square from left to right side of T (Option D).
$\Rightarrow \boxed{D}$

Answer: (D) Go Back to Q25

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	D	2	A	3	B	4	C	5	D
6	A	7	B	8	C	9	D	10	A
11	B	12	C	13	D	14	A	15	B
16	C	17	D	18	A	19	B	20	C
21	D	22	A	23	B	24	C	25	D