

MAHCET Abstract Reasoning

Sample Paper – 9

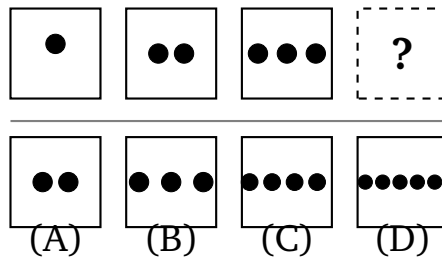
Duration: 19 Minutes **Total Marks:** 25 **Questions:** 25 **Negative Marking:** None

Instructions

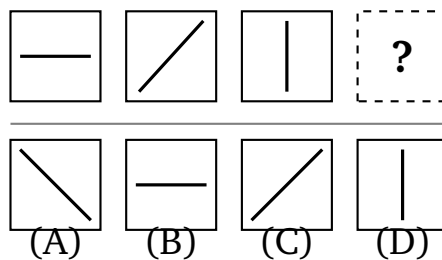
- This paper contains 25 questions from the Abstract Reasoning section of MAHCET.
- Each question carries 1 mark. There is no negative marking for wrong answers.
- All questions are compulsory. Choose the best option from (A), (B), (C), (D).
- This is a Computer Based Test (CBT). No physical calculator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

Abstract Reasoning

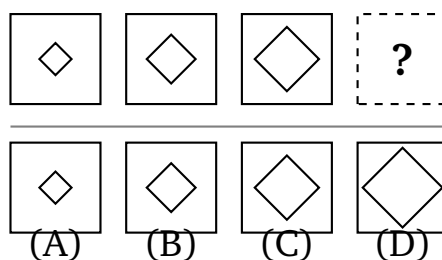
Q1. Find the missing figure in the series.



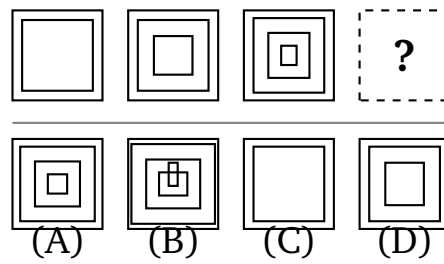
Q2. Find the missing figure in the series.



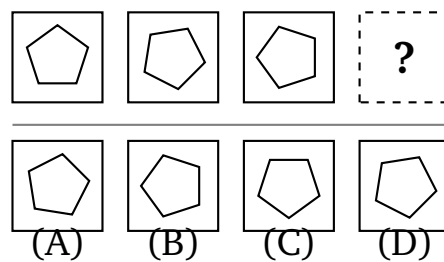
Q3. Find the missing figure in the series.



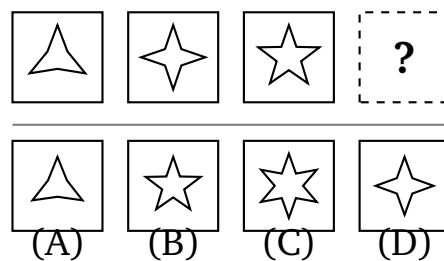
Q4. Find the missing figure in the series.



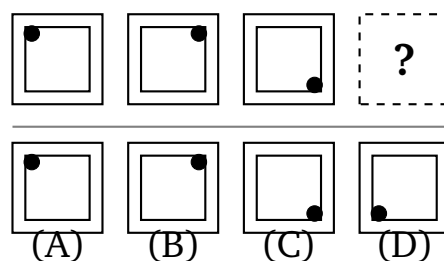
Q5. Find the missing figure in the series.



Q6. Find the missing figure in the series.

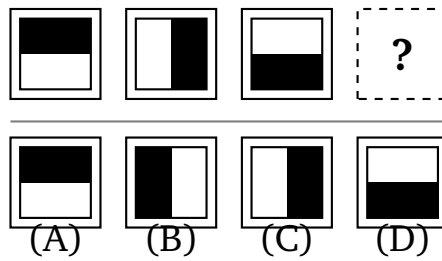


Q7. Find the missing figure in the series.

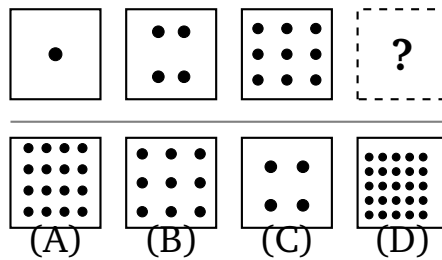


Q8. Find the missing figure in the series.

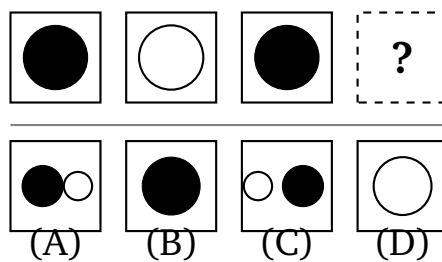




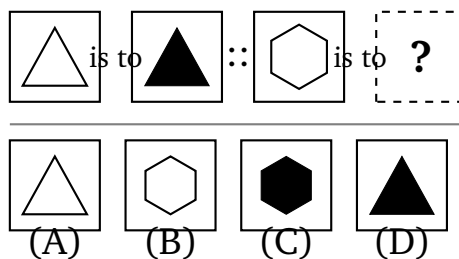
Q9. Find the missing figure in the series.



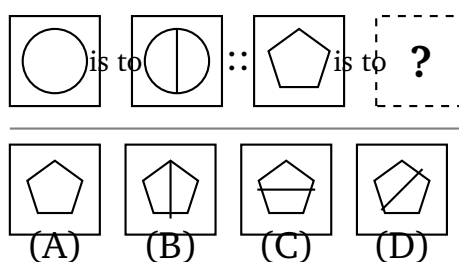
Q10. Find the missing figure in the series.



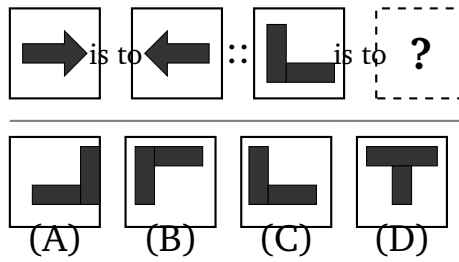
Q11. Choose the figure that completes the analogy.



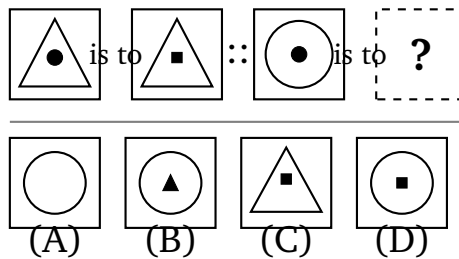
Q12. Choose the figure that completes the analogy.



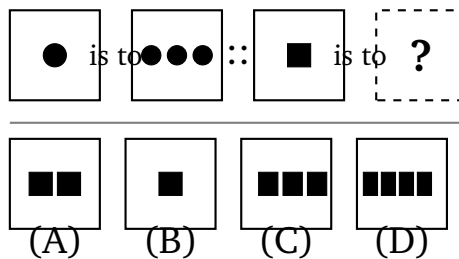
Q13. Choose the figure that completes the analogy.



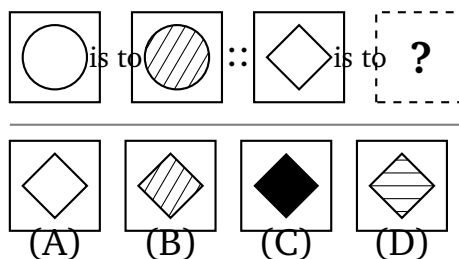
Q14. Choose the figure that completes the analogy.



Q15. Choose the figure that completes the analogy.

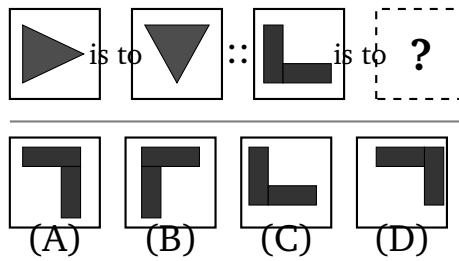


Q16. Choose the figure that completes the analogy.

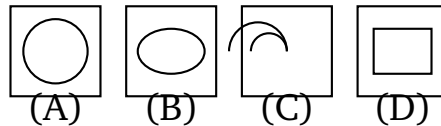


Q17. Choose the figure that completes the analogy.

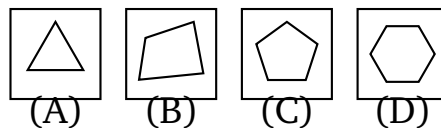




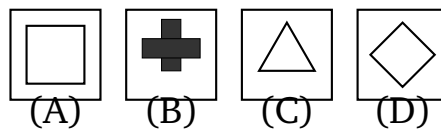
Q18. Which figure does NOT belong to the group?



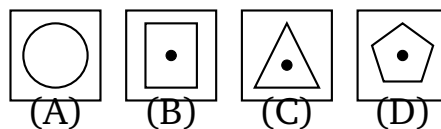
Q19. Which figure does NOT belong to the group?



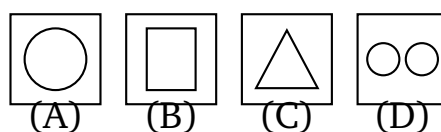
Q20. Which figure does NOT belong to the group?



Q21. Which figure does NOT belong to the group?

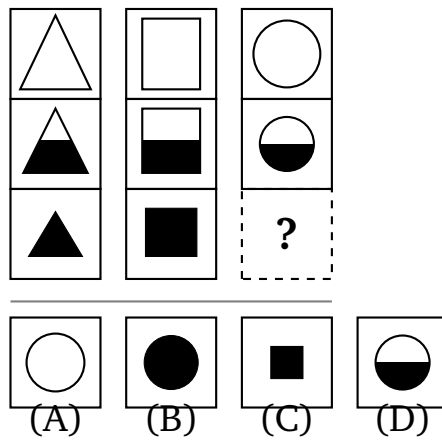


Q22. Which figure does NOT belong to the group?

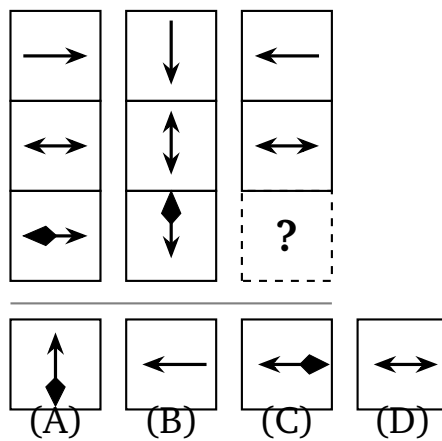


Q23. Find the missing figure in the 3×3 matrix.

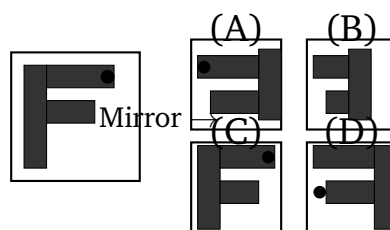




Q24. Find the missing figure in the 3×3 matrix.



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



Detailed Solutions

1.

Solution**Concept — Series: Dot Count Increasing by 1****Identify the rule:** The number of filled circles increases by one each step: Frame 1 = 1 dot, Frame 2 = 2 dots side by side, Frame 3 = 3 dots in a row.**Apply the rule:** Frame 4 must show 4 filled circles in a row. Option C shows exactly 4 dots arranged in a single row.**Why other options are wrong:**

- Option A: 2 dots — matches Frame 2, already used.
- Option B: 3 dots — matches Frame 3, already used.
- Option D: 5 dots — skips Step 4 and goes one step further.

Final Answer: Dots increase by 1 per frame; Frame 4 = 4 dots in a row. $\Rightarrow$ [Go Back to Q1](#)

2.

Solution**Concept — Series: Bar Rotating 45° Clockwise****Identify the rule:** A single thick bar rotates 45° clockwise at each step: Frame 1 = horizontal (0°), Frame 2 = NE diagonal (45° CW), Frame 3 = vertical (90° CW).**Apply the rule:** The next 45° CW rotation from vertical (90°) gives a NW diagonal (135° CW, from bottom-right to top-left). Option A shows this NW-oriented diagonal bar.**Why other options are wrong:**

- Option B: horizontal bar — matches Frame 1 orientation.
- Option C: NE diagonal — matches Frame 2 orientation.
- Option D: vertical bar — matches Frame 3 orientation.

Final Answer: Bar rotates 45° CW each step; Frame 4 = NW diagonal (Option A). $\Rightarrow$ [Go Back to Q2](#)

3.

Solution**Concept — Series: Expanding Diamond Outline**

Identify the rule: The diamond (rotated square) grows uniformly in size each step: Frame 1 = small ($r \approx 0.25$), Frame 2 = medium ($r \approx 0.38$), Frame 3 = large ($r \approx 0.50$).

Apply the rule: Frame 4 requires an extra-large diamond with $r \approx 0.62$. Option D shows the largest diamond that fills nearly the entire frame.

Why other options are wrong:

- Option A: small diamond — matches Frame 1.
- Option B: medium diamond — matches Frame 2.
- Option C: large diamond — matches Frame 3.

Final Answer: Diamond expands each step; Frame 4 = extra-large diamond (Option D). $\Rightarrow$

Answer: (D) [Go Back to Q3](#)

4.

Solution**Concept — Series: Concentric Squares Increasing by 1**

Identify the rule: One additional nested outline square is added inside at each step: Frame 1 = 1 square, Frame 2 = 2 concentric squares, Frame 3 = 3 concentric squares.

Apply the rule: Frame 4 requires 4 concentric outline squares. Option B shows four nested squares with a small innermost square at center.

Why other options are wrong:

- Option A: 3 concentric squares — matches Frame 3.
- Option C: 1 square — matches Frame 1.
- Option D: 2 concentric squares — matches Frame 2.

Final Answer: Concentric squares increase by 1 per step; Frame 4 = 4 squares (Option B). $\Rightarrow$



Answer: (B) [Go Back to Q4](#)

5.

Solution

Concept — Series: Pentagon Rotating 45° Counter-Clockwise

Identify the rule: The regular pentagon rotates 45° counter-clockwise at each step: Frame 1 = vertex pointing up (90°), Frame 2 = vertex pointing upper-left (135°), Frame 3 = vertex pointing left (180°).

Apply the rule: The next 45° CCW rotation from left (180°) gives vertex pointing lower-left (225°). Option A shows the pentagon with its vertex oriented toward the lower-left.

Why other options are wrong:

- Option B: vertex pointing left (180°) — matches Frame 3.
- Option C: vertex pointing down (270°) — skips 225° and goes too far.
- Option D: vertex at 135° — matches Frame 2.

Final Answer: Pentagon rotates 45° CCW per step; Frame 4 = vertex at lower-left (Option A). $\Rightarrow$

Answer: (A) [Go Back to Q5](#)

6.

Solution

Concept — Series: Star Points Increasing by 1

Identify the rule: The number of star points increases by one each step: Frame 1 = 3-point star, Frame 2 = 4-point star, Frame 3 = 5-point star.

Apply the rule: Frame 4 requires a 6-point star (6 symmetric points). Option C shows the 6-pointed star with 6 outer vertices alternating with 6 inner vertices.

Why other options are wrong:

- Option A: 3-point star — matches Frame 1.
- Option B: 5-point star — matches Frame 3.



- Option D: 4-point star — matches Frame 2.

Final Answer: Star points increase by 1 per step; Frame 4 = 6-point star (Option C). $\Rightarrow$

Answer: (C) [Go Back to Q6](#)

7.

Solution

Concept — Series: Moving Dot Cycles Through Corners Clockwise

Identify the rule: A filled black dot moves to successive corners of the inner square in clockwise order: Frame 1 = top-left, Frame 2 = top-right, Frame 3 = bottom-right.

Apply the rule: The next corner clockwise from bottom-right is bottom-left. Option D shows the dot at the bottom-left corner of the inner square.

Why other options are wrong:

- Option A: dot at top-left — matches Frame 1.
- Option B: dot at top-right — matches Frame 2.
- Option C: dot at bottom-right — matches Frame 3.

Final Answer: Dot cycles CW through corners; Frame 4 = bottom-left corner (Option D). $\Rightarrow$

Answer: (D) [Go Back to Q7](#)



8.

Solution**Concept — Series: Shaded Half Rotates 90° Clockwise**

Identify the rule: The filled (black) half of the rectangle rotates 90° clockwise at each step: Frame 1 = top half filled, Frame 2 = right half filled, Frame 3 = bottom half filled.

Apply the rule: The next 90° CW rotation from bottom gives the left half. Option B shows the rectangle with its left half filled black.

Why other options are wrong:

- Option A: top half filled — matches Frame 1.
- Option C: right half filled — matches Frame 2.
- Option D: bottom half filled — matches Frame 3.

Final Answer: Shaded half rotates 90° CW per step; Frame 4 = left half filled (Option B). $\Rightarrow$

Answer: (B) [Go Back to Q8](#)

9.

Solution**Concept — Series: Square Grid of Dots Expanding**

Identify the rule: The dot array forms a perfect square grid that grows by one row and column each step: Frame 1 = 1×1 (1 dot), Frame 2 = 2×2 (4 dots), Frame 3 = 3×3 (9 dots).

Apply the rule: Frame 4 requires a 4×4 grid of 16 dots. Option A shows 16 evenly spaced dots in a 4×4 arrangement.

Why other options are wrong:

- Option B: 9 dots (3×3) — matches Frame 3.
- Option C: 4 dots (2×2) — matches Frame 2.
- Option D: 25 dots (5×5) — skips 4×4 and goes one step further.

Final Answer: Square grid grows by 1 per step; Frame 4 = $4 \times 4 = 16$ dots (Option A). $\Rightarrow$



Answer: (A) [Go Back to Q9](#)

10.

Solution

Concept — Series: Alternating Filled and Outline Circle

Identify the rule: The circle alternates between fully filled (black) and outline (empty) at each step: Frame 1 = filled, Frame 2 = outline, Frame 3 = filled.

Apply the rule: Frame 4 continues the alternation and must show a single outline circle. Option D shows one large outline circle with no fill.

Why other options are wrong:

- Option A: two circles (filled + outline) — shows two shapes, not one.
- Option B: filled circle — same as Frames 1 and 3, wrong for Step 4.
- Option C: two circles (outline + filled) — shows two shapes, not one.

Final Answer: Pattern alternates filled/outline; Frame 4 = single outline circle (Option D). ⇒ **D**

Answer: (D) [Go Back to Q10](#)

11.

Solution

Concept — Analogy: Outline Shape Becomes Fully Filled

Identify the rule: The outline shape is filled completely with black: FigA (outline triangle) → FigB (filled triangle). Apply the same rule to FigC (outline hexagon).

Apply the rule: Filling the outline hexagon completely gives a solid black hexagon. Option C shows the fully filled black hexagon.

Why other options are wrong:

- Option A: outline triangle — wrong shape, not derived from FigC.
- Option B: outline hexagon — same as FigC, fill not applied.
- Option D: filled triangle — correct fill style but wrong shape (triangle not hexagon).



Final Answer: Outline → filled black; outline hexagon → filled hexagon (Option C). ⇒

Answer: (C) [Go Back to Q11](#)

12.

Solution

Concept — Analogy: Shape Gains Vertical Line of Symmetry

Identify the rule: A vertical diameter (line from top to bottom through the center) is added to the plain outline shape: FigA (plain circle) → FigB (circle with vertical diameter). Apply to FigC (plain pentagon).

Apply the rule: Adding a vertical line from the top vertex through the center to the base gives a pentagon with a vertical line of symmetry. Option B shows this correctly.

Why other options are wrong:

- Option A: plain pentagon — same as FigC, no line added.
- Option C: pentagon with horizontal line — wrong orientation of the line added.
- Option D: pentagon with diagonal line — wrong orientation, not vertical.

Final Answer: Vertical line added through shape; pentagon + vertical line (Option B). ⇒

Answer: (B) [Go Back to Q12](#)



13.

Solution**Concept — Analogy: Left-Right Mirror Reflection**

Identify the rule: The figure is reflected horizontally (left-right mirror): FigA (right-pointing arrow) → FigB (left-pointing arrow, its mirror). Apply the same left-right flip to FigC (L-shape with vertical bar on left and horizontal bar at bottom going right).

Apply the rule: Mirroring the L-shape left-right moves the vertical bar to the right and the horizontal bar extends to the left from its base — forming a reverse-L (Γ-shape). Option A shows this mirrored shape.

Why other options are wrong:

- Option B: upside-down L (vertical left, bar at top) — a vertical flip, not horizontal.
- Option C: same L as FigC — no reflection applied.
- Option D: rotated T-shape — a different shape entirely, not a mirrored L.

Final Answer: Left-right mirror of L-shape = reverse-L (Γ-shape, Option A). ⇒ A

Answer: (A) [Go Back to Q13](#)

14.

Solution**Concept — Analogy: Inner Shape Changes from Circle to Square**

Identify the rule: The outer shape stays the same while the small inner element changes from a filled circle to a filled square: FigA (triangle + inner circle) → FigB (triangle + inner square). Apply to FigC (large circle + inner filled circle).

Apply the rule: Replacing the inner circle with a small filled square inside the outer circle gives a large outline circle with a small filled square inside. Option D shows this correctly.

Why other options are wrong:

- Option A: circle with nothing inside — inner element removed, not replaced.
- Option B: circle with triangle inside — inner shape changed to triangle, not square.



- Option C: triangle with small square inside — wrong outer shape (triangle instead of circle).

Final Answer: Inner element changes circle → square; circle + inner square (Option D). ⇒

Answer: (D) [Go Back to Q14](#)

15.

Solution

Concept — Analogy: Count Triples ($\times 3$)

Identify the rule: The number of shapes triples: FigA (1 circle) → FigB (3 circles in a row). Apply the same tripling to FigC (1 square).

Apply the rule: Tripling 1 square gives 3 squares in a row. Option C shows three small filled squares arranged side by side.

Why other options are wrong:

- Option A: 2 squares — doubled, not tripled.
- Option B: 1 square — same as FigC, count unchanged.
- Option D: 4 squares — quadrupled, not tripled.

Final Answer: Count triples; 1 square → 3 squares in a row (Option C). ⇒

Answer: (C) [Go Back to Q15](#)



16.

Solution**Concept — Analogy: Adding Diagonal Hatching Inside Shape**

Identify the rule: Diagonal hatching lines (NE direction) are added inside the plain outline shape: FigA (plain circle) → FigB (circle with diagonal hatching). Apply to FigC (plain diamond).

Apply the rule: Adding diagonal hatching inside the diamond gives a diamond filled with NE diagonal lines. Option B shows this hatched diamond.

Why other options are wrong:

- Option A: plain diamond — same as FigC, no hatching added.
- Option C: solid black diamond — completely filled, not hatched.
- Option D: diamond with horizontal stripes — wrong line direction (horizontal not diagonal).

Final Answer: Diagonal hatching added inside shape; diamond with hatching (Option B). ⇒ B

Answer: (B) [Go Back to Q16](#)

17.

Solution**Concept — Analogy: Shape Rotates 90° Clockwise**

Identify the rule: The shape undergoes a 90° clockwise rotation: FigA (equilateral triangle pointing right) → FigB (equilateral triangle pointing down, 90° CW). Apply the same 90° CW rotation to FigC (L-shape: vertical bar on left, horizontal bar at bottom going right).

Apply the rule: Rotating the L-shape 90° CW: the left-vertical bar becomes a top-horizontal bar, and the bottom-horizontal bar becomes a right-vertical bar. Result: horizontal bar at top going right + vertical bar going down on the right side. Option A shows this rotated L.

Why other options are wrong:

- Option B: L rotated 90° CCW (different rotation direction).
- Option C: normal L — same as FigC, no rotation applied.



- Option D: L rotated 180° — over-rotated (vertical bar on right, horizontal at top going left).

Final Answer: L-shape rotated 90° CW = horizontal top + vertical right side (Option A). $\Rightarrow$

Answer: (A) [Go Back to Q17](#)

18.

Solution

Concept — Odd One Out: No Curved Boundary

Identify the rule: Three of the four figures have curved boundaries: (A) circle, (B) ellipse, and (C) crescent/semicircle are all made entirely of curved lines. Option (D) is a rectangle, which is composed entirely of straight lines with no curves.

Apply the rule: The rectangle is the only figure lacking any curved boundary, making it the odd one out.

Why other options are wrong:

- Option A: circle — all curved, belongs to the group.
- Option B: ellipse — all curved, belongs to the group.
- Option C: crescent/semicircle — composed of curved arcs, belongs to the group.

Final Answer: Rectangle has only straight lines, unlike the curved shapes (Option D). $\Rightarrow$

Answer: (D) [Go Back to Q18](#)



19.

Solution**Concept — Odd One Out: Irregular Polygon Among Regular Polygons**

Identify the rule: Three figures are regular polygons (all sides equal, all angles equal): (A) equilateral triangle, (C) regular pentagon, (D) regular hexagon. Option (B) is an irregular quadrilateral with unequal sides and unequal angles.

Apply the rule: The irregular quadrilateral does not satisfy the equal-sides, equal-angles property of regular polygons, so it is the odd one out.

Why other options are wrong:

- Option A: equilateral triangle — regular (3 equal sides/angles), belongs to the group.
- Option C: regular pentagon — regular (5 equal sides/angles), belongs to the group.
- Option D: regular hexagon — regular (6 equal sides/angles), belongs to the group.

Final Answer: Irregular quadrilateral has unequal sides — not a regular polygon (Option B). $\Rightarrow$ **B**

Answer: (B) [Go Back to Q19](#)

20.

Solution**Concept — Odd One Out: Different Rotational Symmetry Order**

Identify the rule: Three figures have 4-fold rotational symmetry (look identical every 90° rotation): (A) square, (B) plus/cross shape, (D) diamond (45° -rotated square). Option (C) is an equilateral triangle, which has only 3-fold rotational symmetry (identical every 120°).

Apply the rule: The equilateral triangle's rotational symmetry order (3) differs from the rest (4), making it the odd one out.

Why other options are wrong:

- Option A: square — 4-fold symmetry, belongs to the group.
- Option B: plus shape — 4-fold symmetry, belongs to the group.



- Option D: diamond — 4-fold symmetry, belongs to the group.

Final Answer: Equilateral triangle has 3-fold (not 4-fold) rotational symmetry (Option C). $\Rightarrow$

Answer: (C) [Go Back to Q20](#)

21.

Solution

Concept — Odd One Out: Missing Center Dot

Identify the rule: Three figures each show a large outline shape with a small filled dot at the center: (B) square with dot, (C) triangle with dot, (D) pentagon with dot. Option (A) is a large outline circle but has NO center dot — the same shape type appears in the group but without the common element.

Apply the rule: The outline circle is missing the center dot that all the other shapes possess, making it the odd one out.

Why other options are wrong:

- Option B: square with center dot — has the center dot, belongs to the group.
- Option C: triangle with center dot — has the center dot, belongs to the group.
- Option D: pentagon with center dot — has the center dot, belongs to the group.

Final Answer: Outline circle lacks the center dot present in all other shapes (Option A). $\Rightarrow$

Answer: (A) [Go Back to Q21](#)



22.

Solution**Concept — Odd One Out: Two Separate Pieces vs Single Closed Curve**

Identify the rule: Three figures are each formed by a single closed curve: (A) circle, (B) outline square, (C) outline triangle — all are single connected closed shapes. Option (D) shows two small circles side by side, which are two separate, disconnected pieces.

Apply the rule: The pair of circles cannot be traced as a single closed curve; they are topologically two distinct closed curves. This makes Option D the odd one out.

Why other options are wrong:

- Option A: circle — single closed curve, belongs to the group.
- Option B: square — single closed curve, belongs to the group.
- Option C: triangle — single closed curve, belongs to the group.

Final Answer: Two circles = two separate pieces, not one closed curve (Option D). $\Rightarrow$ D

Answer: (D) [Go Back to Q22](#)

23.

Solution**Concept — Matrix: Fill Level $\times$ Shape Type**

Identify the rule: Two rules govern the matrix simultaneously: rows control the fill style (Row 1 = outline/empty, Row 2 = half-filled at bottom, Row 3 = fully filled black) and columns control the shape (Col 1 = triangle, Col 2 = square, Col 3 = circle).

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

Why other options are wrong:

- Option A: outline circle — matches Row 1 fill style, not Row 3.
- Option C: filled black square — correct fill but wrong shape (Col 2 shape, not Col 3).
- Option D: half-filled circle — matches Row 2 fill style, not Row 3.



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

Answer: (B) [Go Back to Q23](#)

24.

Solution

Concept — Matrix: Direction Rotates 90° CW Across Columns, Row Controls Arrow Style

Identify the rule: Columns control direction (Col 1 = rightward, Col 2 = downward, Col 3 = leftward). Rows control the arrowhead style (Row 1 = single-head, Row 2 = double-head, Row 3 = filled-diamond-tail arrow).

Apply the rule: Cell (3,3) is in Row 3 (filled-diamond-tail style) and Col 3 (leftward direction). The answer is a filled-diamond-tail arrow pointing left. Option C shows this correctly.

Why other options are wrong:

- Option A: filled-diamond arrow pointing up — wrong direction (up, not left).
- Option B: single-head arrow pointing left — correct direction but wrong Row 3 style.
- Option D: double-head arrow pointing left — correct direction but Row 2 style, not Row 3.

Final Answer: Row 3 style (diamond tail) + Col 3 direction (left) = diamond-tail arrow pointing left (Option C). $\Rightarrow$

Answer: (C) [Go Back to Q24](#)



25.

Solution**Concept — Mirror Image: Left-Right Reflection of Asymmetric F-Shape**

Identify the rule: A left-right mirror image flips the figure horizontally about the vertical axis. The original figure is an F-shape (vertical bar on left, two horizontal bars extending right) with a small filled dot near the RIGHT end of the upper horizontal bar — this dot is the asymmetric element that distinguishes the mirror. After left-right reflection, the F becomes a reverse-F (vertical bar on right, bars extending left) and the dot moves to the LEFT end of the upper bar.

Apply the rule: In the mirror image: vertical bar moves to the right, horizontal bars extend to the left, and the small dot appears at the left end of the upper bar. Option A shows this correctly.

Why other options are wrong:

- Option B: reverse-F with NO dot — dot is missing, element incorrectly removed.
- Option C: original F with dot at right — same orientation as the given figure, not mirrored.
- Option D: reverse-F with dot on the middle bar — dot placed at wrong bar (middle instead of upper).

Final Answer: Mirror moves dot from right to left end of upper bar on reverse-F (Option A). ⇒ A

Answer: (A) [Go Back to Q25](#)



Answer Key

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

