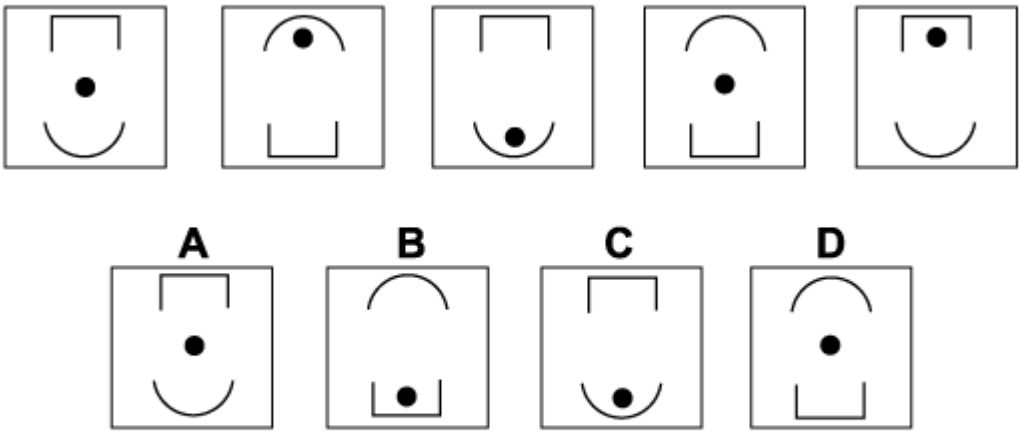
Inductive Reasoning
Practice Test 9

Solution Booklet

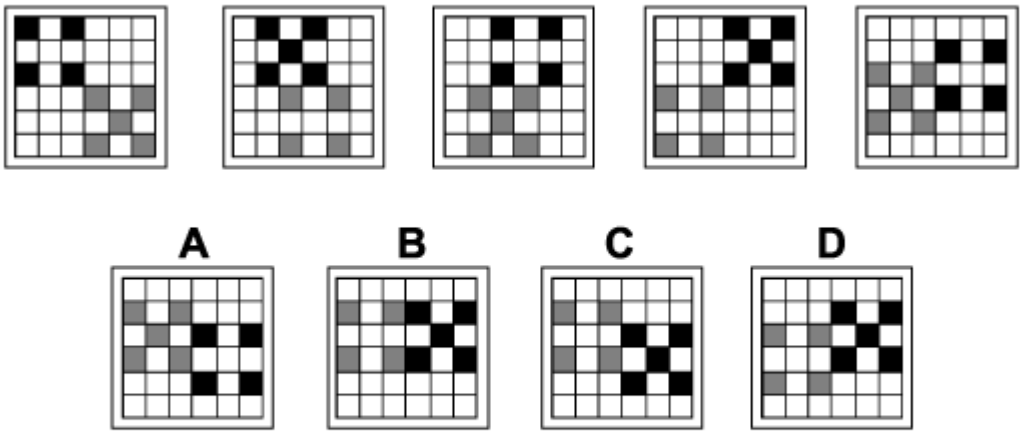
Question 1



Solution: B

Explanation:
In this question, there are two rules to follow.
The first rule is that the curved and straight-edged shapes interchange. Following this rule, the curved shape should be at the top and the straight-edged shape should be at the bottom in the next diagram of the sequence. Therefore, the correct answer could be B or D.
The other rule is that the black spot moves from the centre, to the top, to the bottom, back to the centre, etc. Following this rule, the black spot should be at the bottom in the next diagram in the sequence. Therefore, the correct answer is B.

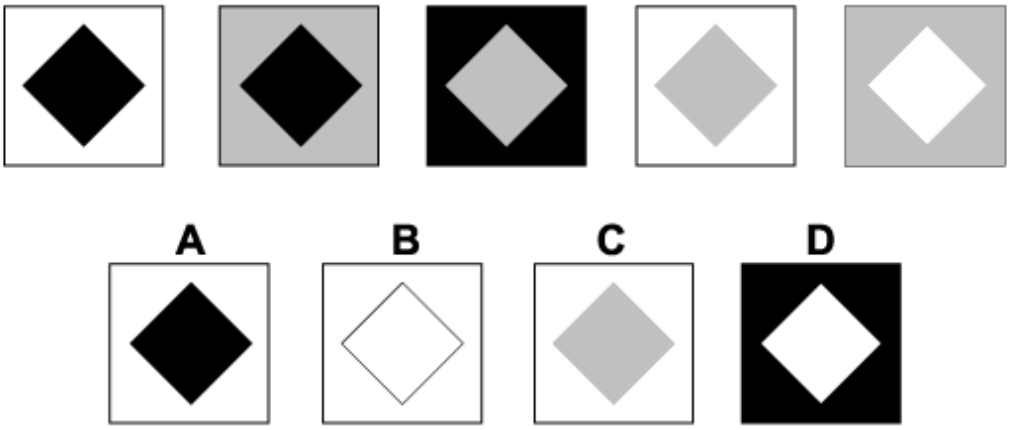
Question 2



Solution: C

Explanation:
In this question, there are two rules to follow.
The first rule concerns the number of coloured squares. There's a group of four black squares that alternate with a group of five black square (the extra black square being in the centre of the group of four). Similarly there's a group of five grey squares that alternate with a group of four grey squares. Following this rule, the next diagram of the sequence should have a group of five black squares and four grey squares. Therefore, the correct answer could be B, C or D.
The other rule is that both groups of squares move one place clockwise around the edge of the grid each time. Following this rule, the group of four black squares should move one further place down (at the same time becoming a group of five), and the group of five grey squares should move one further place up (at the same time becoming a group of four). Therefore, the correct answer is C.

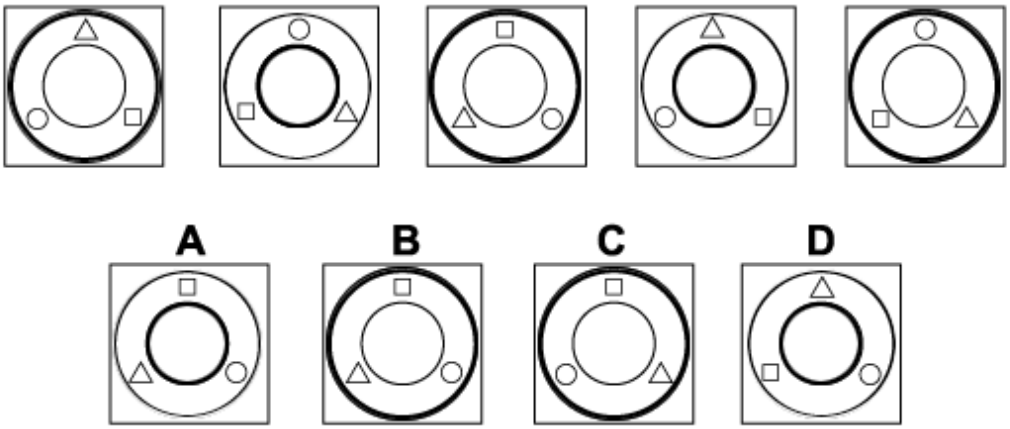
Question 3



Solution: D

Explanation:
In this question, there are two rules to follow.
The first rule concerns the colour of the inner square. The colour of this square follows the pattern: black, black, grey, grey, white, white, etc. Following this rule, in the next diagram of the sequence, the inner square should be white. Therefore, the correct answer could be B or D.
The other rule is that the outer area is coloured white, grey, black, white, grey, black, etc. Following this rule, in the next diagram in the sequence the outer area should be coloured black. Therefore, the correct answer is D.

Question 4

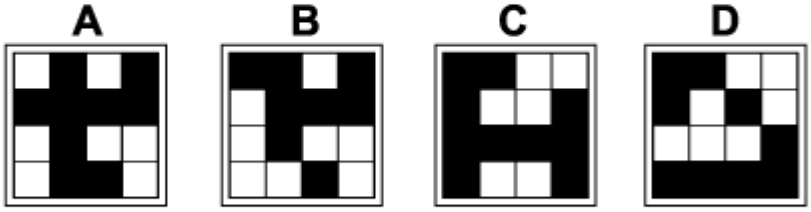


Solution: A

Explanation:
In this question, there are two rules to follow.
The first rule is that the two circles interchange between normal thickness and bold thickness. Following this rule, in the next diagram of the sequence, the outer circle should be normal and the
inner circle should be bold. Therefore, the correct answer could be A, or D.
The other rule is that the three shapes rotate each time by 120° clockwise around the centres of
the circles. Following this rule, the square will rotate to the top (or 12 o'clock), the circle to 4 o'clock and the triangle to 8 o'clock. Therefore, the correct answer is A.

Question 5

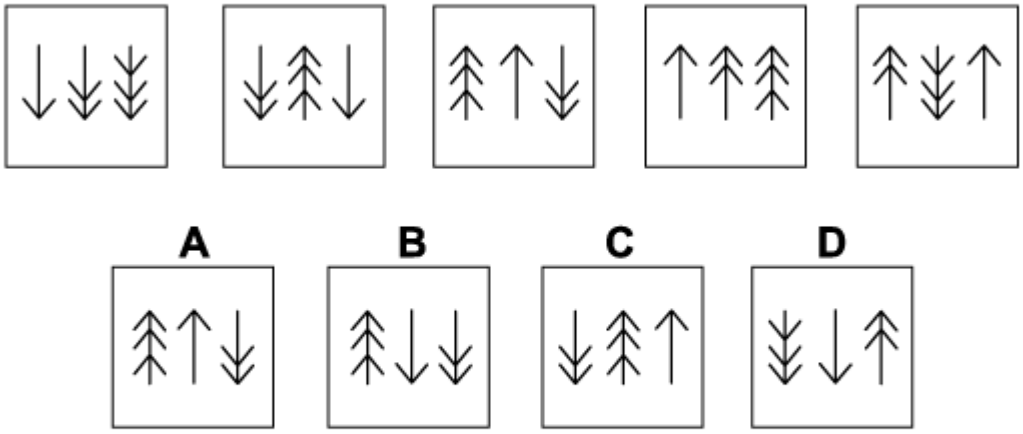
Which of the following replaces the question mark in the sequence?



Solution: D

Explanation:
In this question, there is a pattern of black and white squares.
The rule in this case is that all the squares in the pattern move one place to the right and one place down each time. When they get to the edge of the 4 x 4 grid, they move across to the opposite side of the grid and continue moving in the same pattern.
The correct answer is, therefore, D.

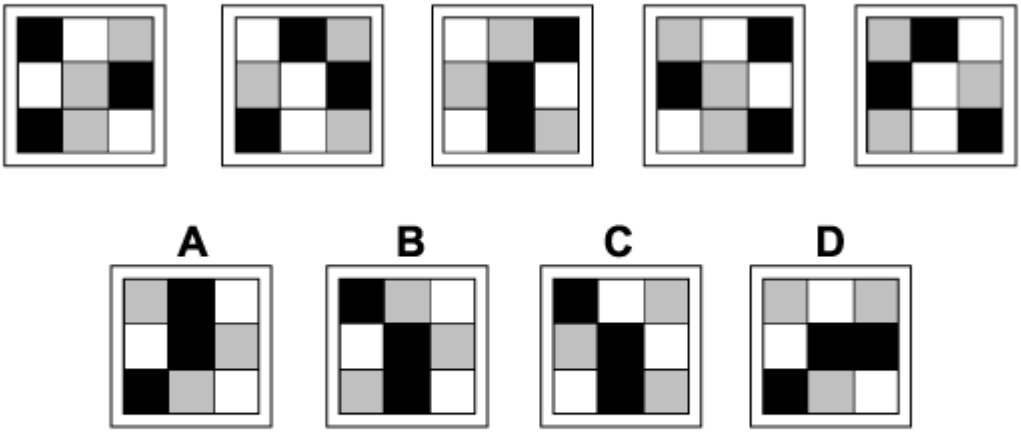
Question 6



Solution: D

Explanation:
In this question, there are two rules to follow.
The first rule concerns the number of arrowheads and the order of the arrows. The number of arrowheads (from left to right) changes from 1, 2, 3 to 2, 3, 1 to 3, 1, 2, back to 1, 2, 3 etc. Following this rule, in the next diagram of the sequence, the order of arrows will be 3, 1, 2. Therefore, the correct answer could be A, B or D.
The other rule is that one arrow changes direction each time. Firstly the arrow with 3 arrowheads changes direction, then the one with 1 arrowhead, then the one with 2 arrowheads, etc. Following this rule, for the next diagram in the sequence the arrow with 1 arrowhead should change direction. Therefore, the correct answer is D.

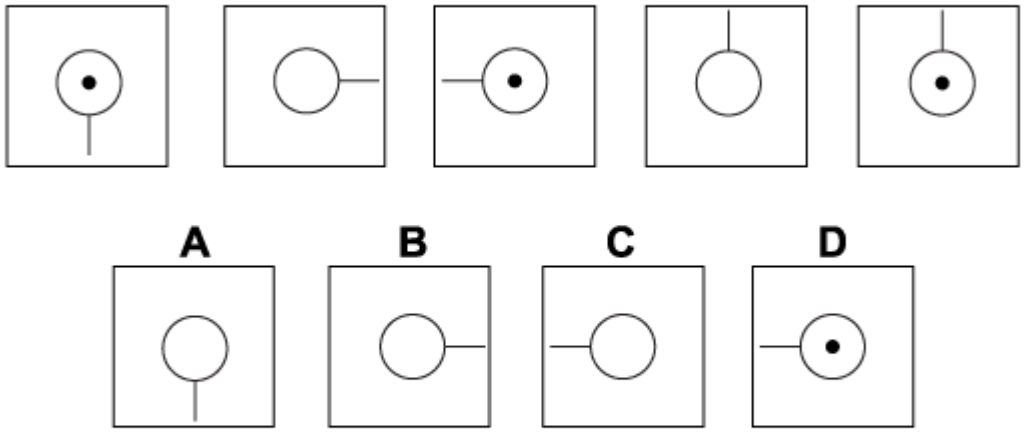
Question 7



Solution: B

Explanation:
In this question, there are two rules to follow at the same time.
The first rule is that the colours of the squares follow a pattern: black squares change to grey, grey change to white and white change to black.
The second rule is that the grid of squares is reflected in a vertical line through the centre of the
grid.
Both these rules have to be applied simultaneously.
Following these rules, the next diagram in the sequence must be B.

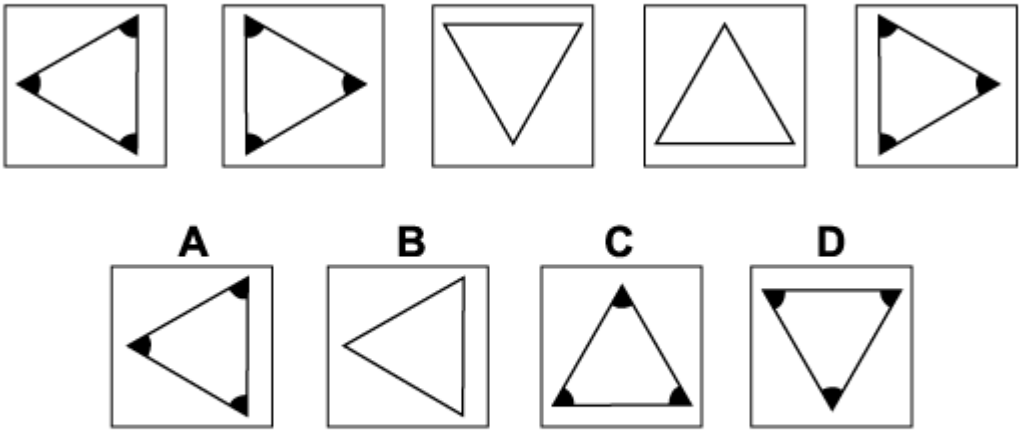
Question 8



Solution: C

Explanation:
In this question, there are two rules to follow.
The first rule is that the absence and presence of the dot in the centre of the circle alternates. Following this rule, in the next diagram of the sequence, there should be no dot. Therefore, the correct answer could be A, B or C.
The other rule is that the straight line rotates through 90° anticlockwise, then 180° anticlockwise, then 270° anticlockwise, then 360° anticlockwise, then back to 90°. Following this rule, the next time the straight line should rotate through 90° anticlockwise. Therefore, the correct answer is C.

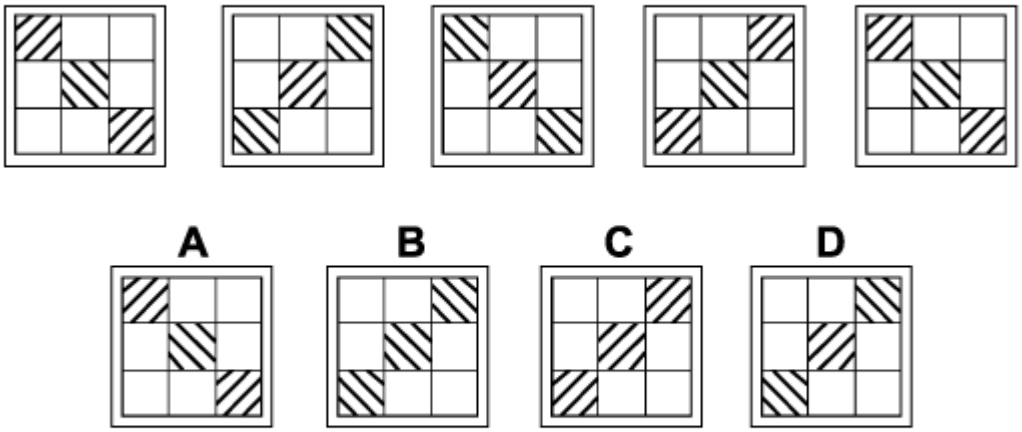
Question 9



Solution: A

Explanation:
In this question, there are two rules to follow.
The first rule is that for two images the angles of the triangle are not shaded, then for the next two they are shaded etc. Following this rule, in the next diagram of the sequence, the angles should be shaded. Therefore, the correct answer could be A, C or D.
The other rule is that the first two triangles are reflections of each other in a vertical line through the centre, then the third triangle is rotated from the first by 90° anticlockwise and the third and fourth triangles are reflections of each other in a horizontal line through the centre etc. Following this rule, the next triangle in the sequence should be a reflection of the fifth triangle in a vertical line through the centre. Therefore, the correct answer is A.

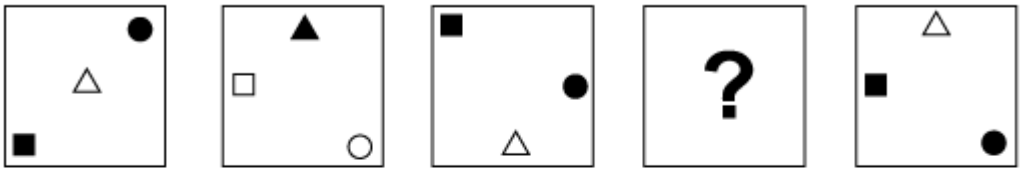
Question 10



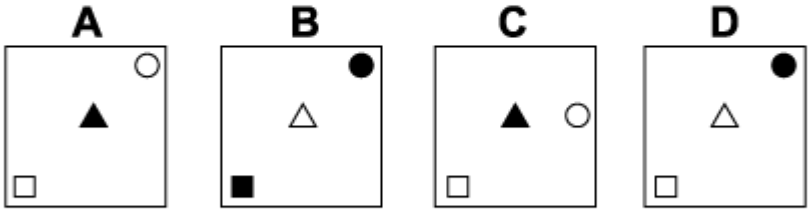
Solution: D

Explanation:
In this question, there are two rules that must be followed, one after the other.
The first rule is: the grid is reflected in a vertical line through its centre. The second rule is: the grid is reflected in a vertical line through its centre **and** the directions of the shadings are reversed.
Following these rules, to get the next diagram in the sequence, the grid is reflected in a vertical line through its centre. Therefore, the correct answer is D.

Question 11



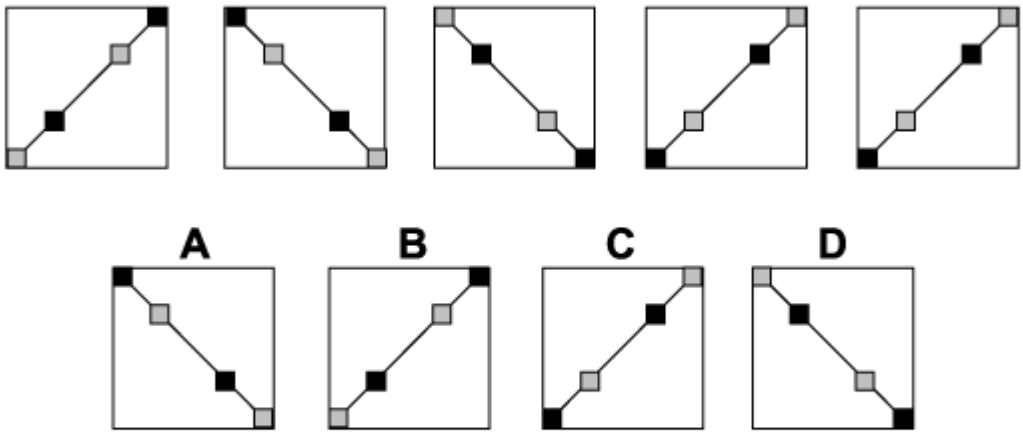
Which of the following replaces the question mark in the sequence?



Solution: A

Explanation:
In this question, imagine the diagram is divided into a 3 by 3 grid. The square always stays in the left-hand column and moves up one place each time, changing alternately from a black square to a white square. The triangle always stays in the middle column and moves up one place each time, changing alternately from a white triangle to a black triangle. The circle always stays in the right-hand column and moves up one place each time, changing alternately from a black circle to a white circle. When each shape reaches the top place in its column, in the next diagram of the sequence it moves to the bottom place.
For the missing image, therefore, the white square will be in the bottom place of its column, the black triangle will be in the middle place of its column and the white circle will be in the top place of its column.
The correct answer is, therefore, A.

Question 12



Solution: D

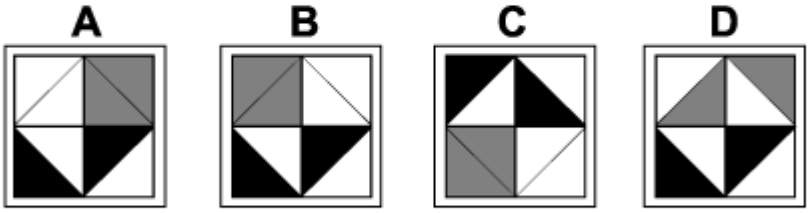
Explanation:
This question is about reflection. The diagonal with four squares, two black and two grey, is alternately reflected in:

1. A line passing vertically through the centre of the square and
2. The diagonal line from the bottom left corner to the top right corner.

The relative positions of the four squares on the line do not change
Following this rule, the next diagram in the sequence will result from a reflection in a line passing vertically through the centre of the square.
The correct answer is, therefore, D.

Question 13

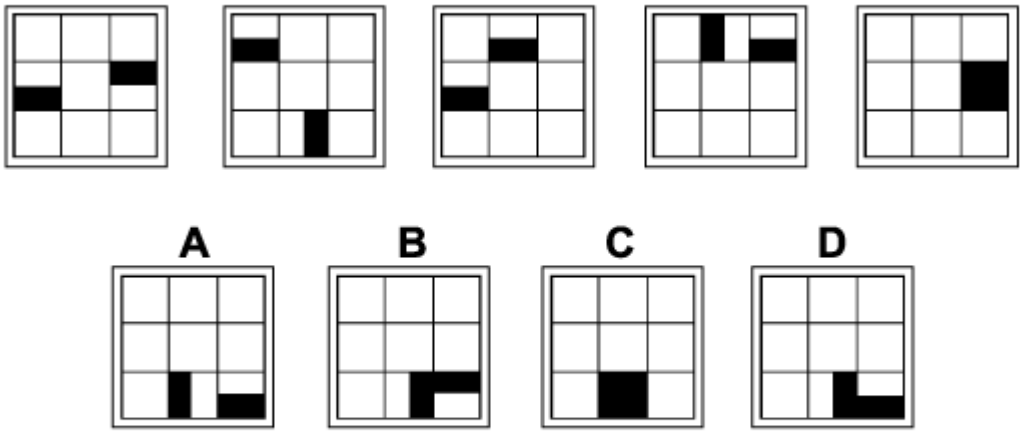
Which of the following replaces the question mark in the sequence?



Solution: B

Explanation:
In this question, each of the colours black and grey has an outer triangle and an inner triangle. For each colour, the outer triangle rotates 90° clockwise each time and the inner triangle rotates 90° anticlockwise each time.
From the second diagram of the sequence, therefore, the outer black triangle will rotate to the bottom left corner of the diagram, the inner black triangle will rotate to the bottom right corner of the diagram, the outer grey triangle will rotate to the top left corner of the diagram, and the inner grey triangle will rotate to the top left corner of the diagram.
The correct answer is, therefore, B.

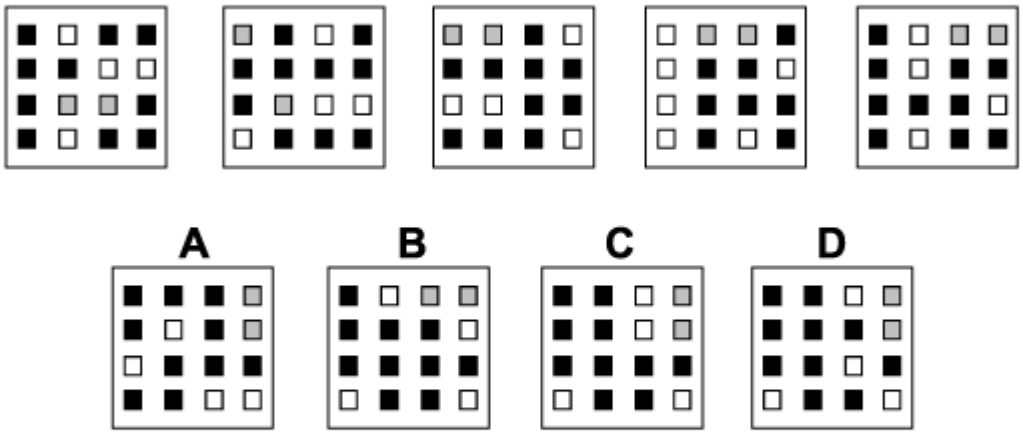
Question 14



Solution: D

Explanation:
In this question there are two tiles that are half black and half white that each follow a different rule.
The tile that starts in the first diagram of the sequence at nine o'clock (with white in the top half and black in the bottom half) rotates clockwise one place around the outside of the grid each time.
The tile that starts in the first diagram of the sequence at three o'clock (with black in the top half and white in the bottom half) rotates clockwise through an angle of 90° about the centre of the grid each time.
Therefore, from the fifth diagram, the bottom black half will move one place down to the bottom right corner of the grid; the top black half will rotate clockwise 90° about the centre of the grid to the bottom centre square of the grid.
The correct answer is, therefore, D.

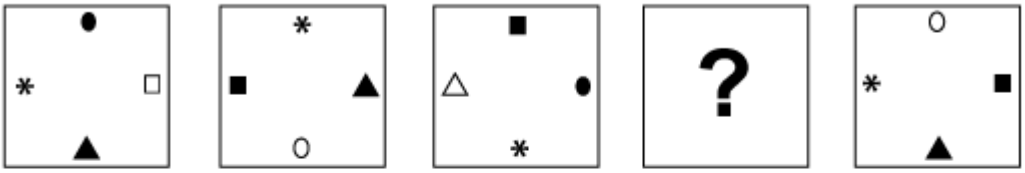
Question 15



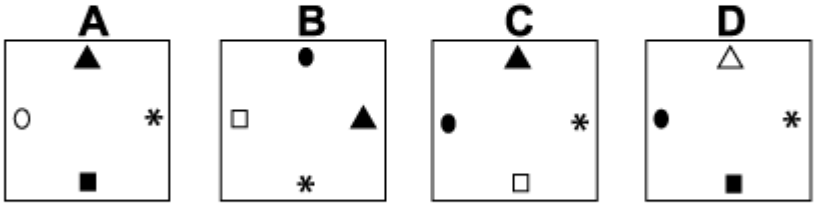
Solution: C

Explanation:
In this question there is a pattern of black (B), white (W) and grey (G) squares. The pattern follows a spiral starting in the top left corner of the grid and moving clockwise around the grid, spiralling towards the centre. The order of squares in the spiral in the first diagram is: B, W, B, B,
W, B, B, B, W, B, B, B, B, W, G, G.
In the second diagram of the sequence, the coloured squares have all moved one place clockwise around the spiral and the final grey square moves to the starting point.
Following this rule, the order of squares in the next diagram of the sequence (after the fifth) will
be: B, B, W, G, G, B, W, B, B, W, B, B, B, W, B, B.
The correct answer, therefore, is C.

Question 16



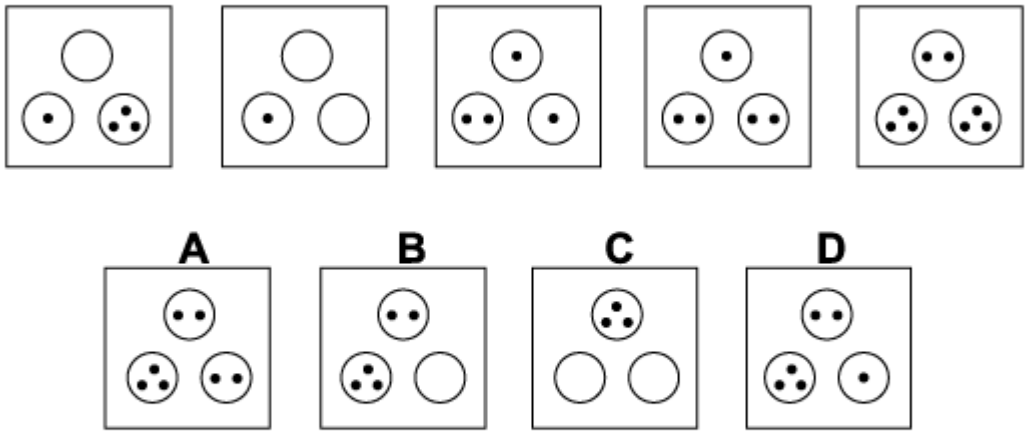
Which of the following replaces the question mark in the sequence?



Solution: C

Explanation:
In this question, there are two rules to follow.
The first rule is that the four shapes (asterisk, circle, triangle and square) rotate around a Zshaped path following the route: 9 o'clock, 12 o'clock, 6 o'clock, 3 o'clock. Following this rule, in
the fourth diagram of the sequence, the circle will be at 9 o'clock, the triangle will be at 12 o'clock,
the square will be at 6 o'clock and the asterisk will be at 3'oclock. The correct answer, therefore,
could be A, C or D.
The other rule is that one of the three shapes – square, circle, triangle – in each diagram is white, in that order. Following this rule, in the fourth diagram of the sequence, the square should
be white.
Therefore, the correct answer is C.

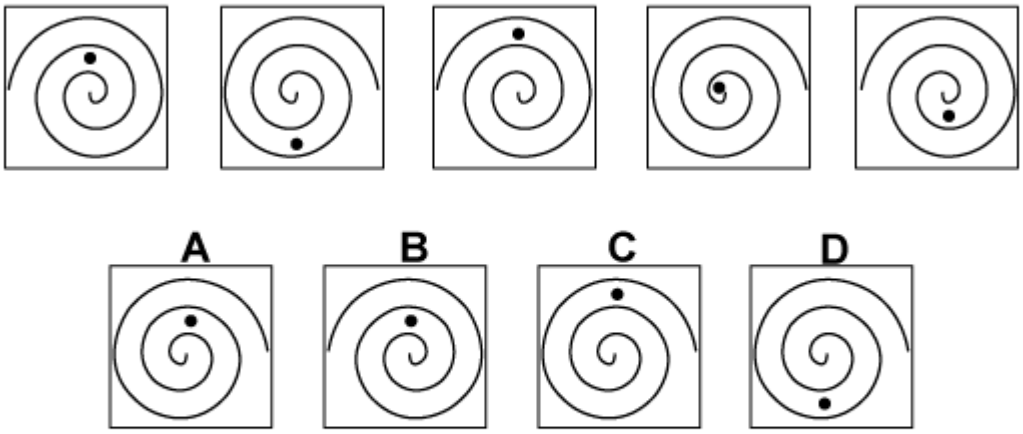
Question 17



Solution: B

Explanation:
In this question, there are two rules to follow which are applied alternately.
The first rule is that the number of dots in the bottom right circle **only** is increased by one.
The other two circles are unchanged.
The second rule is that the number of dots in **all** the circles are increased by one.
These rules are applied alternately with the added condition that 3 + 1 is equivalent to 0.
Following these rules, in the next diagram of the sequence we should increase the number of dots in the bottom right circle **only** by 1 from 3 to 0, leaving the other two circles unchanged.
Therefore, the correct answer is B.

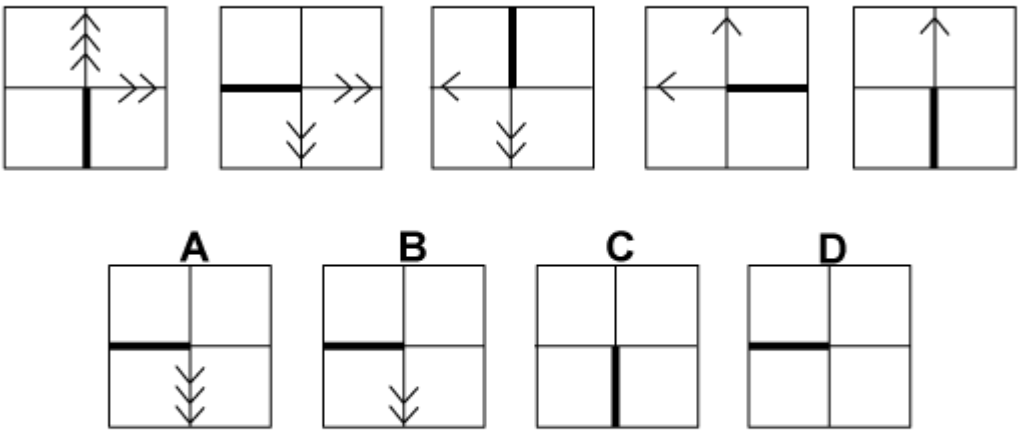
Question 18



Solution: A

Explanation:
In this question, there are two rules to follow.
The first rule is that the spiral changes the direction of its rotation each time – in other words, it's
reflected horizontally. Following this rule, in the next diagram of the sequence, the spiral will turn
clockwise from the centre. The correct answer, therefore, could be A, C or D.
The other rule is that vertically there are five paths within the spiral, including the centre itself. The
dot stays in that vertical line and moves one path further away from the centre each time and returns to the centre after it has reached the fifth path. Following this rule, in the next diagram of
the sequence, the dot should be in the third path from the centre.
Therefore, the correct answer is A.

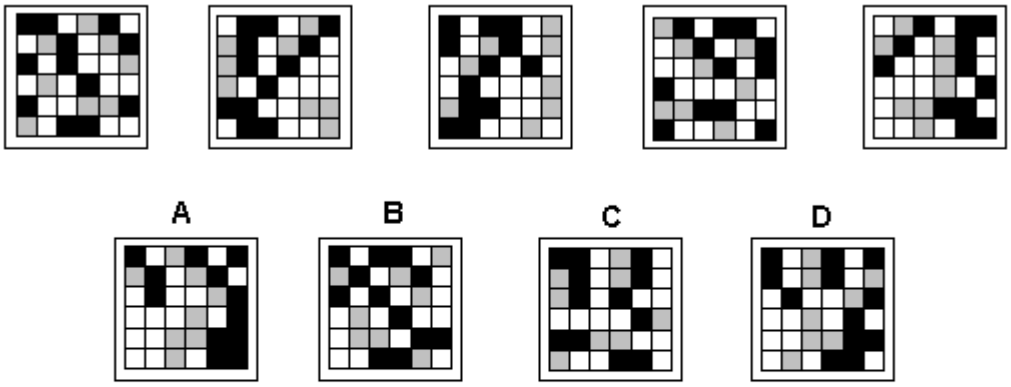
Question 19



Solution: D

Explanation:
In this question, there are two rules to follow.
The first rule is that the whole diagram rotates each time by 90° clockwise. Following this rule, in
the next diagram the thick line will point towards 9 o'clock. The correct answer, therefore, could
be A, B or D.
The other rule concerns the number of arrowheads. There are two lines passing through the centre of the square. One line is half thick (with no arrowheads) and, on the other half of that line,
the number of arrowheads decreases by one, then stays the same, then decreases by one, etc.
The other line is half thin (with no arrowheads) and, on the other half of that line, the number of
arrowheads stays the same, then decreases by one, then stays the same, etc. Following this rule,
in the next diagram of the sequence, the line that is half thick will have one fewer i.e. zero arrowheads, and the line that is half thin will have the same number i.e. zero arrowheads.
Therefore, the correct answer is D.

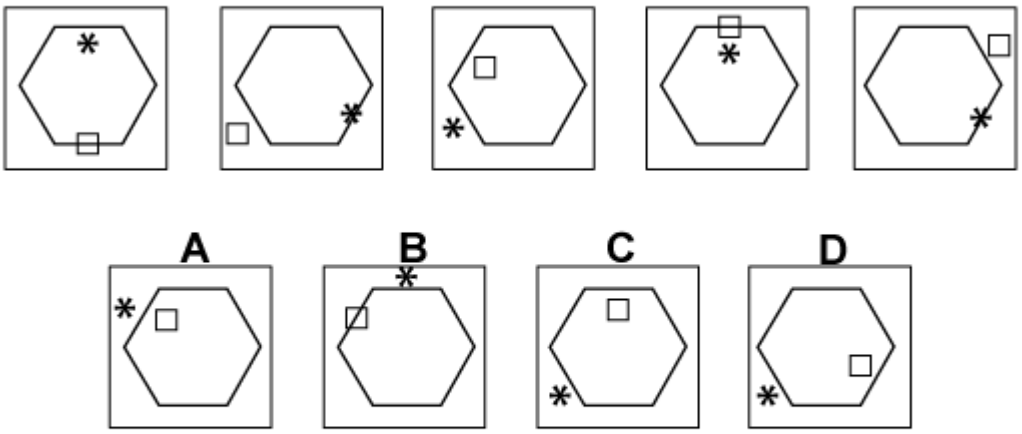
Question 20



Solution: D

Explanation:
In this question, there is a grid of black, grey and white squares with six rows. Starting from the
top, the squares in the first, third and fifth rows move one place to the right each time, and the squares in the second, fourth and sixth rows move one place to the left each time.
Therefore, the correct answer is D.

Question 21



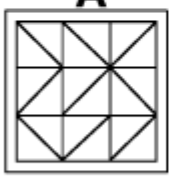
Solution: D

Explanation:
In this question, the asterisk rotates around the hexagon 120° clockwise each time and is placed
successively inside, on and outside the boundary of the hexagon. The square, however, rotates
around the hexagon 60° clockwise each time and is placed successively on, outside and inside
the boundary of the hexagon.
For the nest diagram of the sequence, therefore, the asterisk should rotate to the bottom left edge
of the hexagon and is placed outside, whereas the square rotates to the bottom edge of the hexagon and is placed inside.
Therefore, the correct answer is D.

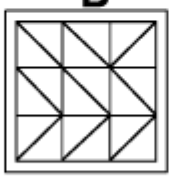
Question 22

Which of the following replaces the question mark in the sequence?

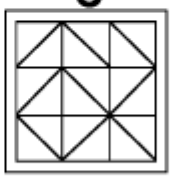
A



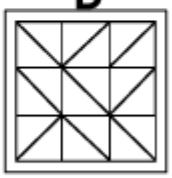
B



C



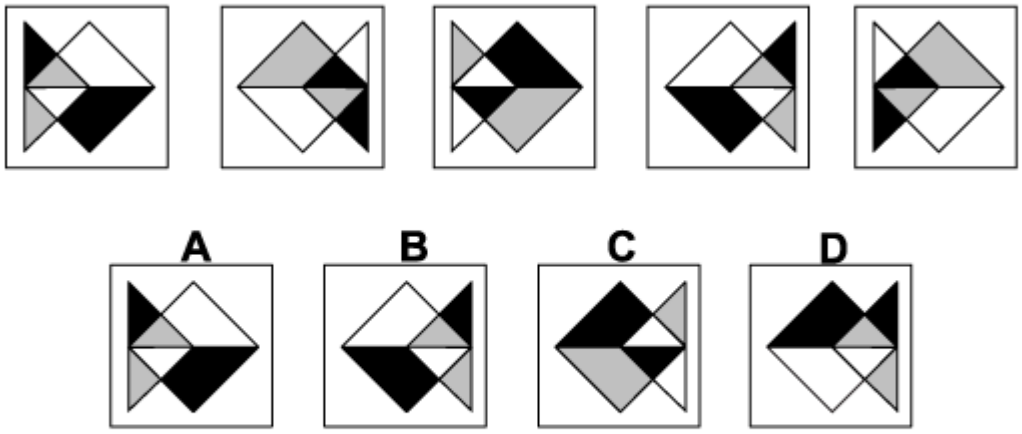
D



Solution: B

Explanation:
In this question, there are two rules to follow which are applied alternately.
The first rule is that the diagonals in the top and bottom rows of the grid reverse direction while
the diagonals of the middle row stay the same.
The second rule is that the diagonals in the left and right columns of the grid reverse direction while the diagonals of the middle column stay the same.
Following these rules, to obtain the missing diagram of the sequence we should apply the second
rule and to obtain the one after the missing one we should apply the first rule.
Therefore, the correct answer is B.

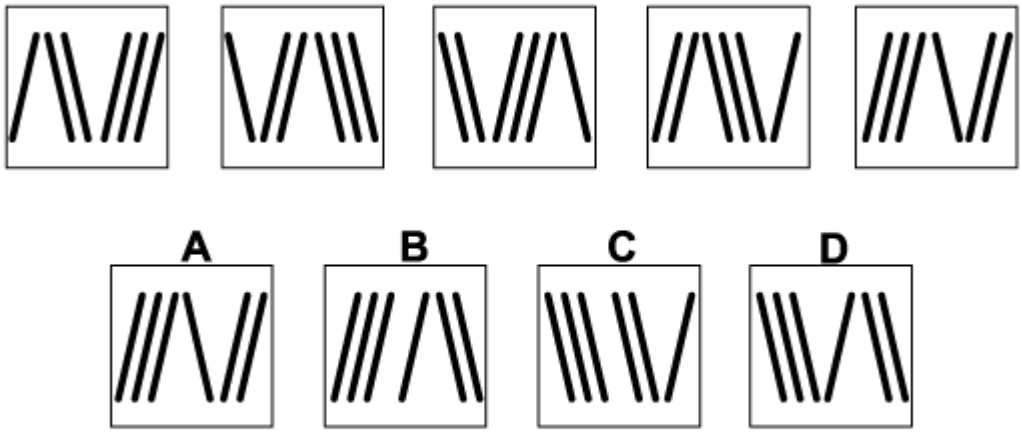
Question 23



Solution: C

Explanation:
In this question, there are two rules to follow.
The first rule is that the shape each time rotates horizontally so that it reverses direction. Following this rule, in the next diagram of the sequence, the corner of the square will point towards the left. The correct answer, therefore, could be B, C or D.
The other rule is that the colours of the six regions of the shape change from one diagram to the
next in the order: black changes to white, white changes to grey and grey changes to black. Following this rule, therefore, the correct answer is C.

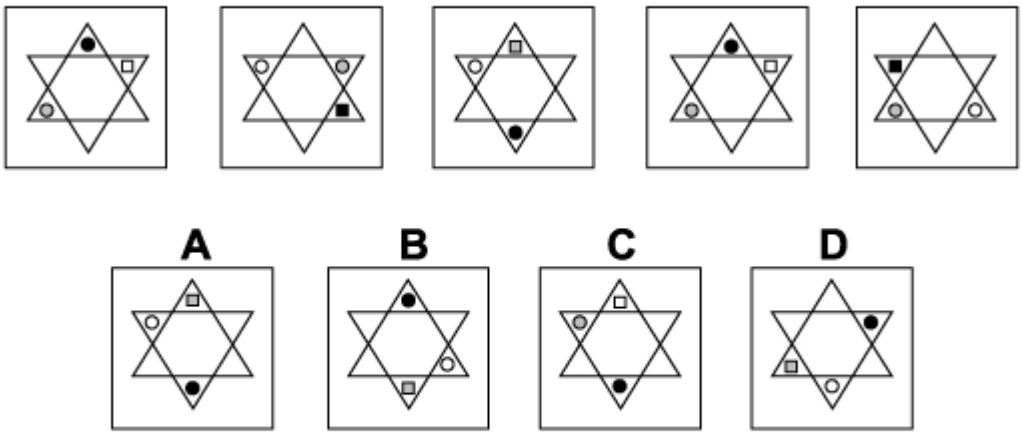
Question 24



Solution: D

Explanation:
In this question, there are three bundles of lines, one containing one line, the second containing
two lines and the third containing three lines.
There are also two rules to follow.
The first rule is that the three bundles are arranged 1, 2, 3 for the first two diagrams, 2, 3, 1 for
the next two and 3, 1, 2 for the next two, etc. Following this rule, in the next diagram of the sequence, the order should be 3, 1, 2. The correct answer, therefore, could be A, B or D.
The other rule is that the slope of the bundles of lines reverses from the first bundle to the second
bundle, and reverses again for the third bundle. Following this rule, therefore, the slope of the three bundles should be negative, positive, negative.
The correct answer, therefore, is D.

Question 25



Solution: A

Explanation:
In this question, there are two rules to follow.
The first rule is that the colours of the shapes change each time, following this pattern: grey changes to white, white changes to black and black changes to grey. Following this rule, in the
next diagram of the sequence, the square should be grey, the circle adjacent to the square should be white and the circle opposite the square should be black. The correct answer, therefore, could be A, B or D.
The other rule is that the shapes rotate around the outside of the star alternately through 60° clockwise and 120° anticlockwise. Following this rule, to obtain the next diagram in the sequence
the three shapes should rotate through 60° clockwise.
The correct answer, therefore, is A.