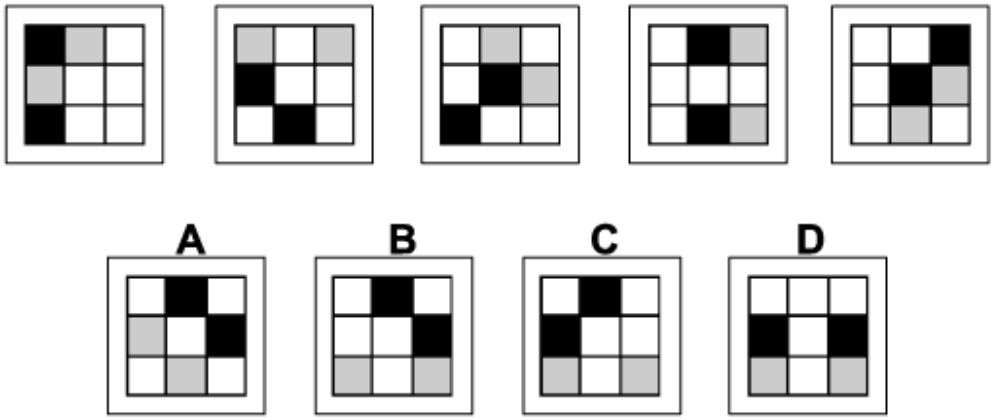
Inductive Reasoning
Practice Test 7

Solution Booklet

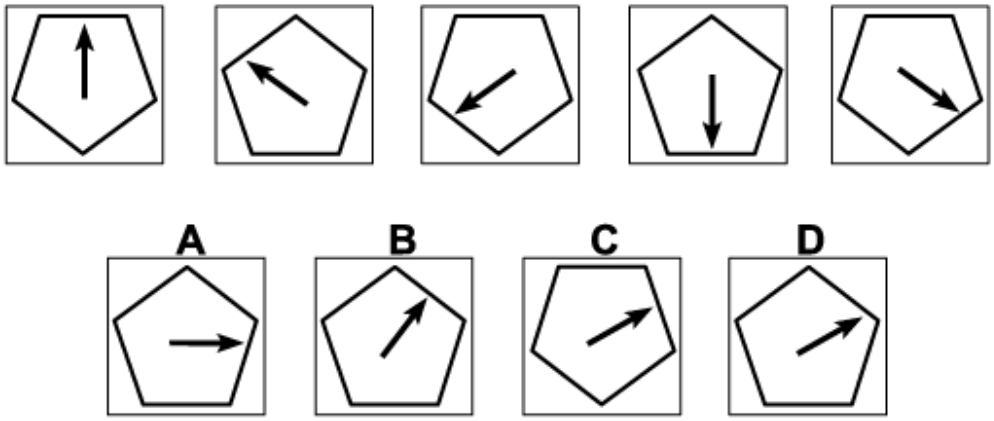
Question 1



Solution: B

Explanation:
In this question there is a grid of nine squares, two of which are black and two grey. The black and grey squares move around the grid, each colour following its own rule.
The grey squares rotate around the eight squares on the perimeter of the grid, rotating 1 place clockwise each time. Following this rule, the correct answer could be B, C or D.
The black squares follow a zigzag pattern, also moving one place each time; firstly down the left column of the grid, then up the middle column, and then down the right column. When this rule is also applied, the correct answer must be B.

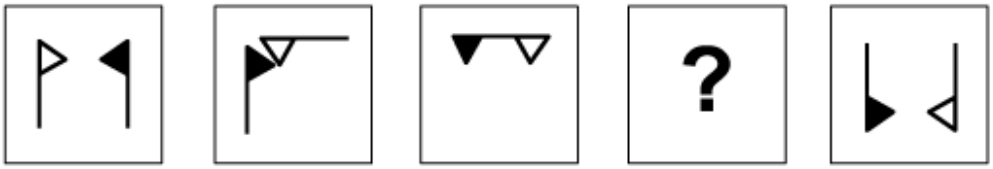
Question 2



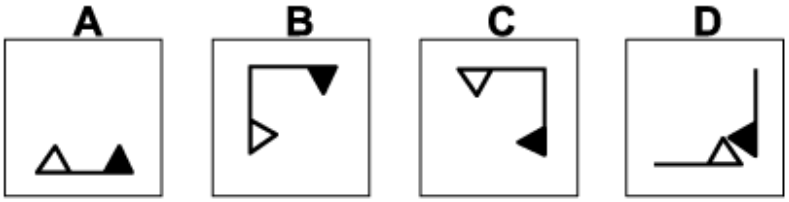
Solution: D

Explanation:
In this question there is a regular pentagon with an arrow at its centre. The pentagon and arrow each follows its own rule.
From one diagram to the next, the pentagon in turned upside down each time. Following this rule, the next diagram of the sequence could be A, B or D.
At the same time, the arrow moves independently, rotating by 60° anticlockwise each time, pointing successively to 12, 10, 8 etc on a clock face. Following this rule, for the next diagram of the sequence the arrow should point towards the number 2 on a clock face. The correct answer, therefore, is D.

Question 3



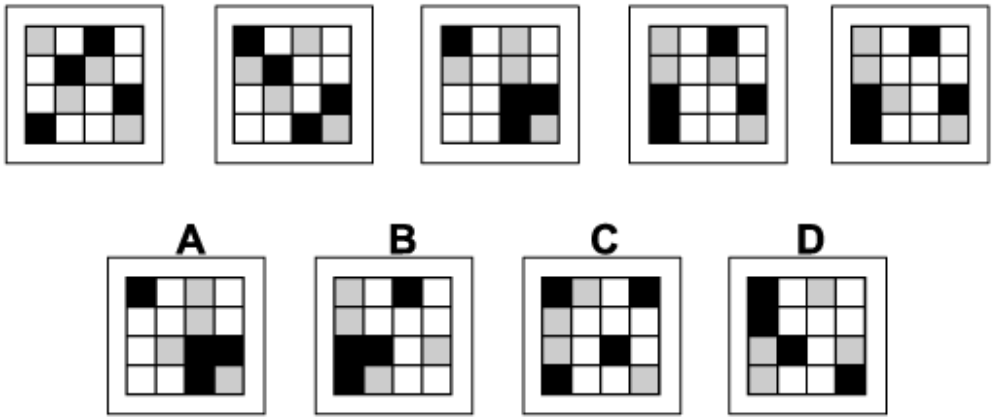
Which of the following replaces the question mark in the sequence?



Solution: B

Explanation:
In this question there is a white flag and a black flag.
The two flags are reflected alternately in two axes. Axis 1 is the vertical axis passing through the centre of the square. Axis 2 is the diagonal line from the top left corner of the square to the bottom right corner of the square.
The first time, the black flag is reflected in Axis 1 and the white flag is reflected in Axis 2.
The next time, the white flag is reflected in Axis 1 and the black flag is reflected in Axis 2.
etc
Following these rules, for the missing diagram of the sequence, the black flag is reflected in Axis 1 and the white flag is reflected in Axis 2, to give us diagram B.

Question 4

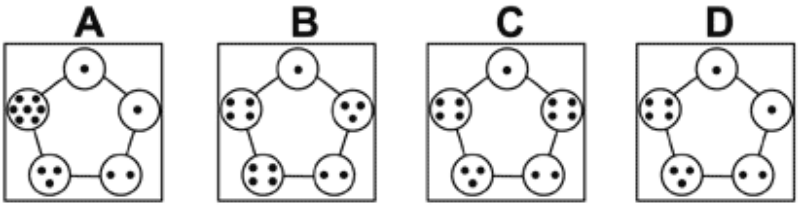


Solution: A

Explanation:
In this question, there is a grid of black, grey and white squares. There are two rules to follow that are applied alternately.
The first rule is that the first and third columns are interchanged while the second and fourth columns remain unchanged.
The second rule is that the four squares in the centre of the grid are rotated by 180°, while the twelve squares around the perimeter do not move.
To obtain the next diagram of the sequence, therefore, the first rule should be applied next, and the correct answer is A.

Question 5

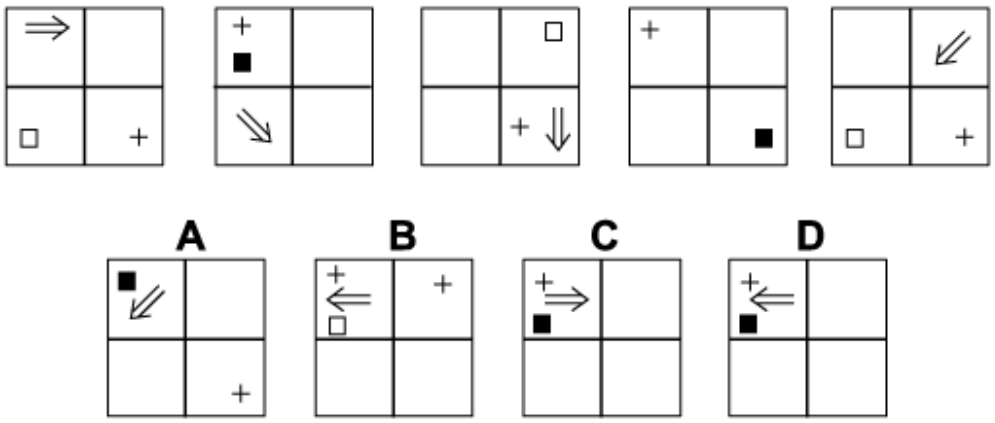
Which of the following replaces the question mark in the sequence?



Solution: C

Explanation:
In this question there are five cells at the corners of a regular pentagon, each containing a number of dots. There are two rules to follow that are applied simultaneously.
The first rule concerns the number of dots, which change as follows: if the number of dots is even, then in the next diagram the number is halved; if the number of dots is odd, then in the next diagram the number is increased by 1.
At the same time a second rule is applied, which is that the cells rotate 1 place anticlockwise each time.
When these two rules are applied simultaneously, the correct answer for the missing diagram is C.

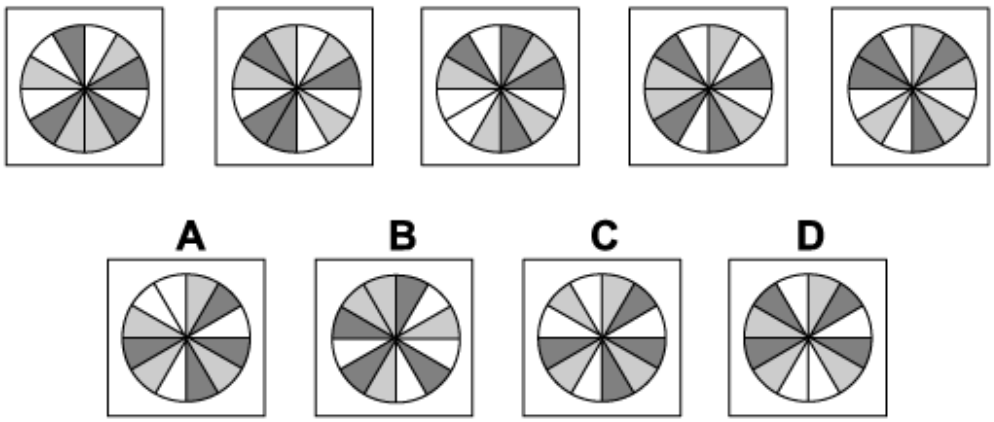
Question 6



Solution: D

Explanation:
In this question there is an arrow, a plus sign and a square that move around the grid each according to its own rule.
From one diagram to the next, the arrow moves one square anticlockwise, but also rotates itself by 45° clockwise. Following this rule, the correct answer could be B or D.
The plus sign alternates between the bottom right corner and the top left corner of the grid. When this rule is also applied, the correct answer could still be B or D.
The square moves one place clockwise around the grid each time, but also alternates between white and black. Following this rule also, the correct answer must be D.

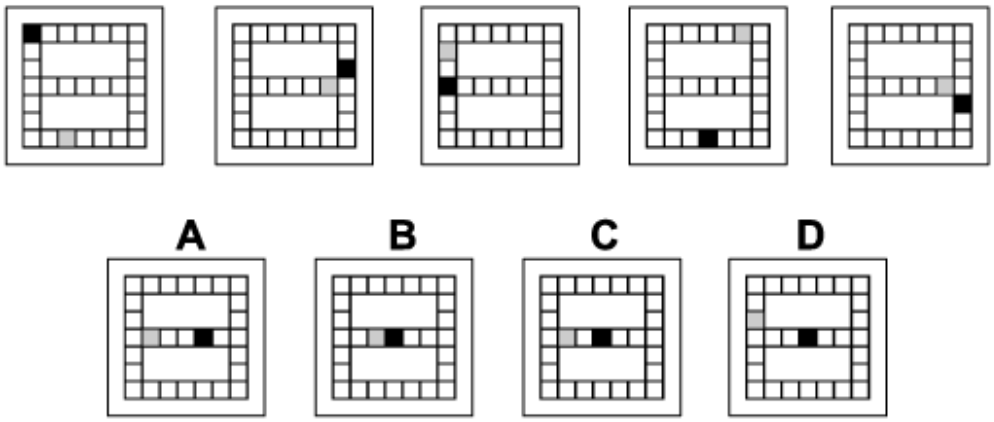
Question 7



Solution: A

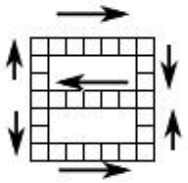
Explanation:
In this question there is a circle divided up into twelve sectors - 4 coloured white, 4 coloured light grey, and 4 coloured dark grey.
There are two rules to follow that are applied simultaneously.
The first rule is that the circle is rotated by 30° clockwise each time.
The second rule is that the colours of the sectors change from one diagram to the next - white changes to light grey, light grey changes to dark grey, and dark grey changes to white.
When these two rules are applied simultaneously, the next diagram in the sequence is A.

Question 8

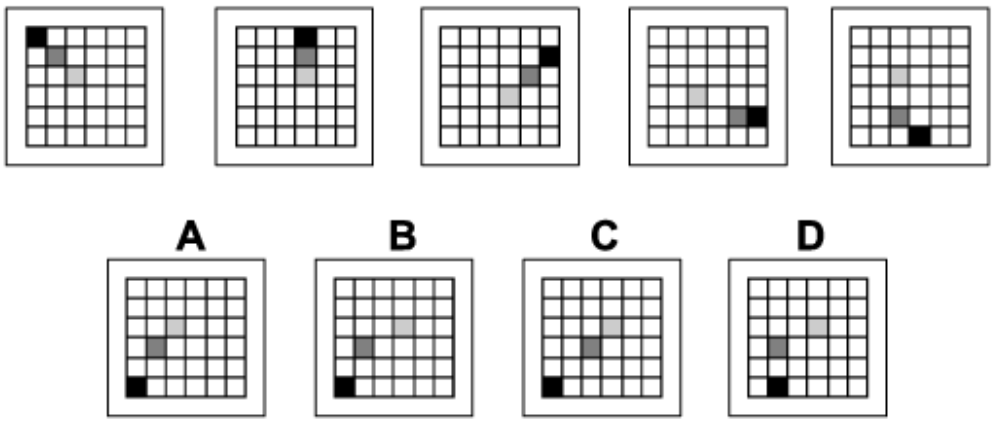


Solution: C

Explanation:
In this question there is a grid in the shape of the number 8 and two squares - one coloured black and one coloured grey.
The two squares move around the grid tracing out the number 8 shape as shown by the arrows in the diagram.
They move eight squares the first time, seven squares the second time, six the third time, and so on. Following this rule, the next diagram in the sequence must be C.



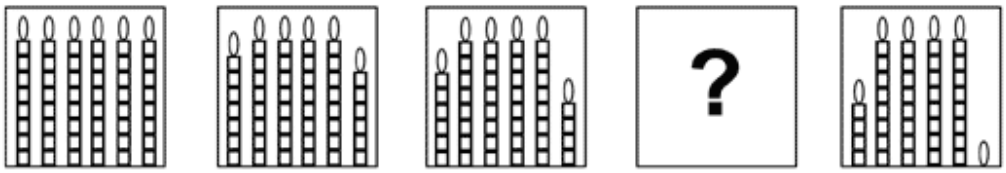
Question 9



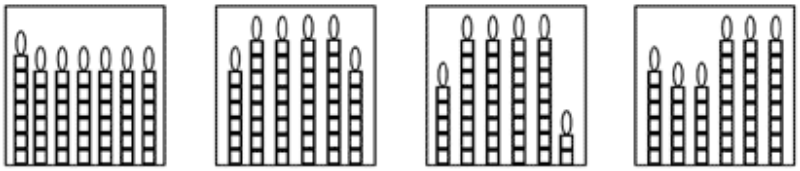
Solution: B

Explanation:
In this question there is a grid of squares, three of which are coloured - one black, one dark grey and one light grey. Each coloured square moves around the grid according to its own rule.
The black square moves around an outer circuit of the grid, consisting of all the squares around the perimeter of the grid, and moves three spaces clockwise each time.
The light grey square moves around an inner circuit of the grid, consisting of the four squares at the centre of the grid, and moves one space clockwise each time.
The dark grey square moves around a middle circuit of the grid, consisting of all the rest of the squares that are not in the outer circuit or the inner circuit, and moves two spaces clockwise each time.
When these rules are applied, the next diagram of the sequence is B.

Question 10



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

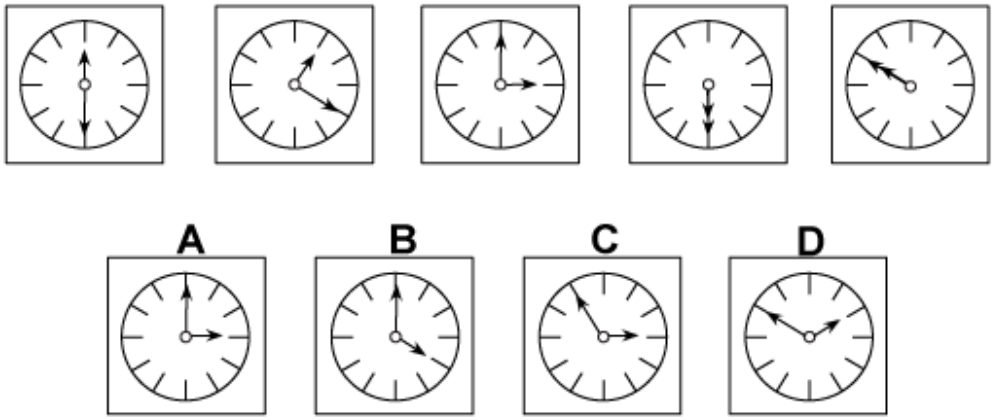


Solution: C

Explanation:
In this question there are six candles each divided into eight equal segments.
Each time the first candle on the left burns down one segment and the last candle on the right burns down two segments. All other candles remain the same.

Following this rule the missing graphic is C.

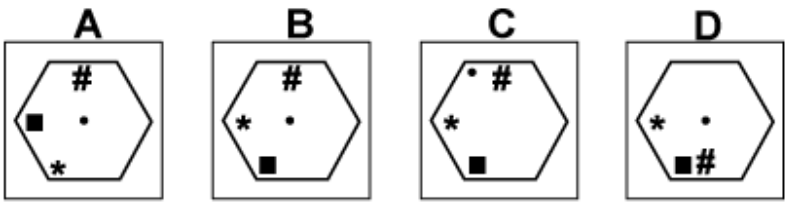
Question 11



Solution: A

Explanation:
In this question there is a clock face with a long hand and a short hand. The two hands rotate around the centre of the clock each according to its own rule.
The short hand rotates clockwise by 30° the first time, 60° the second time, 90° the third time etc. Therefore for the next diagram in the sequence, the short hand should rotate 150° clockwise to point towards the 3 on the clock. The correct answer, therefore, could be A or C.
The long hand rotates anticlockwise by 60° the first time, 120° the second time, 180° the third time etc. Therefore for the next diagram in the sequence, the long hand should rotate 300° anticlockwise to point towards the 12 on the clock. The correct answer, therefore, is A.

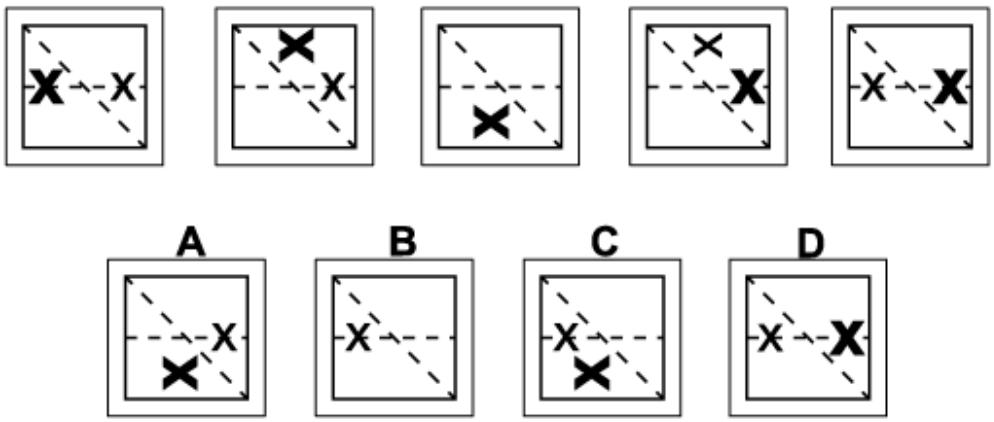
Question 12



Solution: B

Explanation:
In this question there are four shapes - a dot, a square, an asterisk (*) and a hash symbol (**#**) - that move around the inside of a hexagon, each according to its own rule.
The dot moves along the diagonal of the hexagon that stretches from the top left corner to the bottom right corner, moving backwards and forwards one place at a time. Following this rule, the correct answer could be A, B or D.
The square moves around the inside of the vertices of the hexagon, rotating through 120° clockwise each time. Following this rule also, the correct answer must be B or D.
The asterisk moves around the inside of the vertices of the hexagon, rotating through 60° anticlockwise each time. Following this rule, the answer is still either B or D.
The hash symbol moves up and down the vertical axis of the hexagon, moving one place up or down each time.
When all these rules are applied, for the next diagram of the sequence, the correct answer is B.

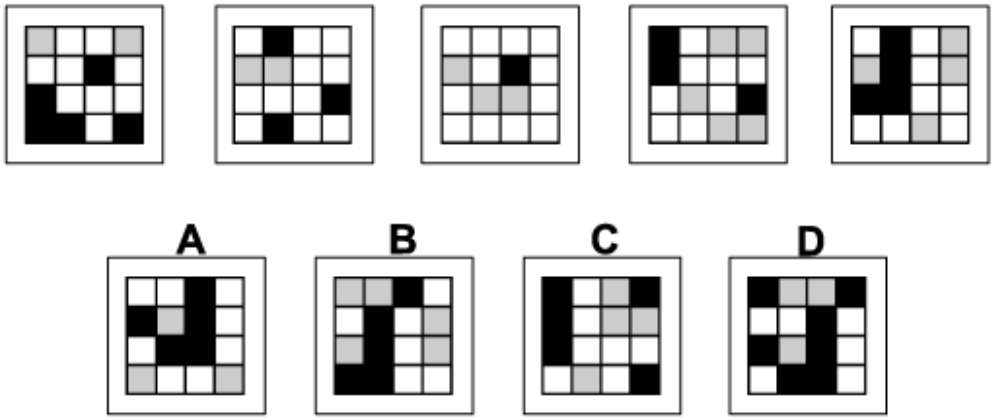
Question 13



Solution: C

Explanation:
In this question there are two X's, one small and one large, that are reflected alternately in each of two mirror lines - a horizontal line and a diagonal line, as shown.
The first time, the small X is reflected in the horizontal line and the big X is reflected in the diagonal line. The second time, the small X is reflected in the diagonal line and the big X is reflected in the horizontal line (and the two X's, in this case, lie one on top of the other - so only the big X is visible), etc.
For the next diagram of the sequence, therefore, the small X should be reflected in the horizontal line and the big X should be reflected in the diagonal line, and the correct answer is C.

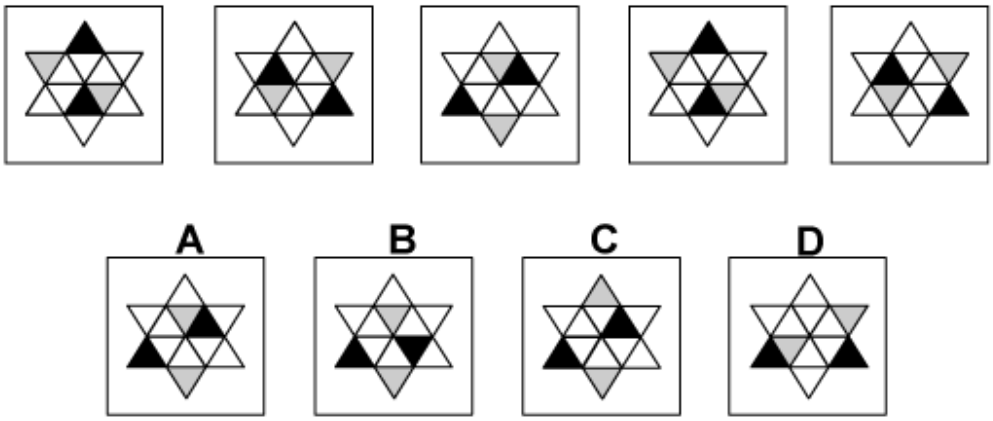
Question 14



Solution: D

Explanation:
In this question there is a grid of black, grey and white squares.
From one diagram to the next, the nine squares in the top left hand corner of one diagram are identical to the nine squares in the bottom right hand corner of the next diagram; so there has been a translation of one square to the right and one square down.
Following this rule, the backwards L shape should move one square to the right and one square down, and the correct answer is D.

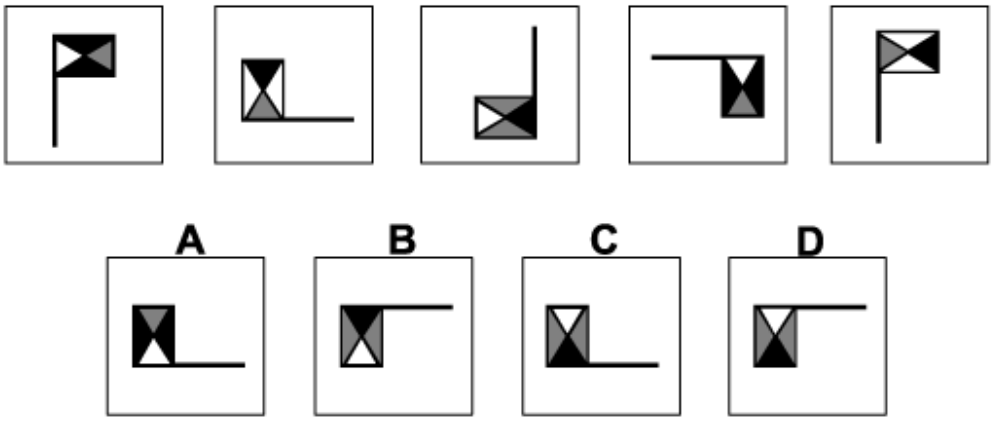
Question 15



Solution: A

Explanation:
In this question there are 12 small equilateral triangles - six with points up and six with points down.
Two triangles are shaded black. These rotate (one place each time) in an anticlockwise sense around the circuit of six points-up triangles.
Two triangles are shaded grey. These rotate (one place each time) in an anticlockwise sense around the circuit of six points-down triangles.
When these rules are applied, the next diagram in the sequence is A.

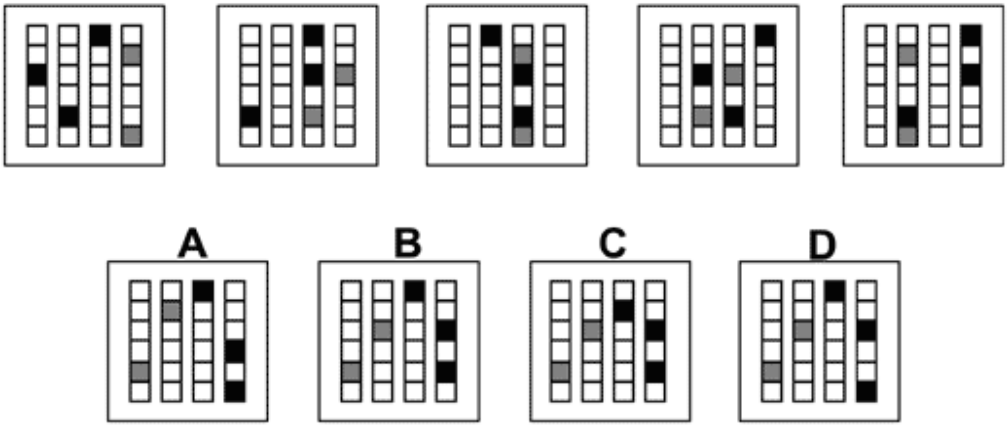
Question 16



Solution: C

Explanation:
In this question there are two rules to follow.
The first rule is that the flag is rotated by 90° anticlockwise each time. Following this rule the correct answer could be A or C.
The second rule is that the colours of the four triangles change each time according to the following pattern: black changes to white, white changes to grey and grey changes to black. When this rule is also applied, the correct answer must be C.

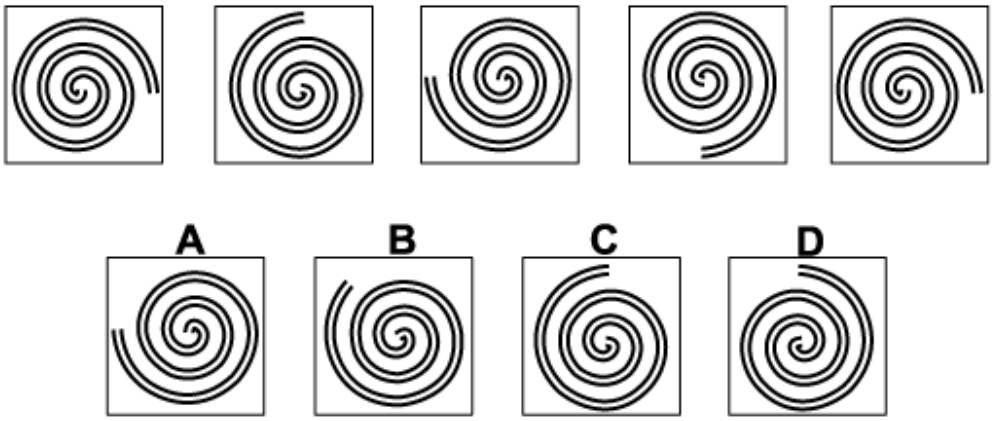
Question 17



Solution: B

Explanation:
In this question there are four columns of six squares each. Three squares are coloured black and two squares are coloured grey. Each colour moves according to its own rule.
The black squares move two places down the columns each time. When they reach the bottom of a column, then they move to the top of the next column to the right.
The grey squares move three places up the columns each time. When they reach the top of a column, then they move to the bottom of the next column to the left.
When these rules are applied simultaneously, the correct answer is B.

Question 18

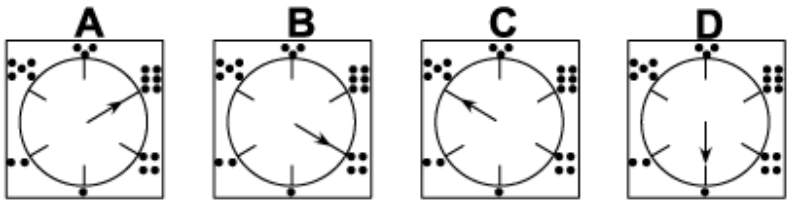


Solution: C

Explanation:
In this question there are two rules to follow that are applied simultaneously.
The first rule is that the spiral is rotated by 45° anticlockwise each time.
The second rule is that a 45° arc of the spiral is erased each time.
When these two rules are applied simultaneously, the correct answer is C.

Question 19

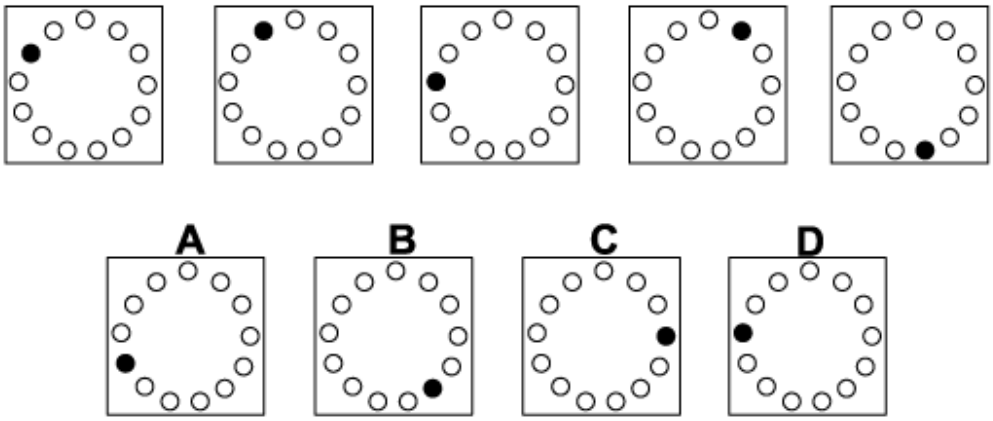
Which of the following replaces the question mark in the sequence?



Solution: D

Explanation:
In this question the hand moves clockwise around the dial according to the number of dots it points to in the previous diagram.
If the number of dots is 1, then it rotates through 60° clockwise.
If the number of dots is 2, then it rotates through 120° clockwise.
If the number of dots is 3, then it rotates through 180° clockwise.
If the number of dots is 4, then it rotates through 240° clockwise.
If the number of dots is 5, then it rotates through 300° clockwise.
If the number of dots is 6, then it rotates through 360° clockwise.
When this rule is applied, for the missing diagram the hand should rotate by 180° clockwise, and the correct answer is D.

Question 20

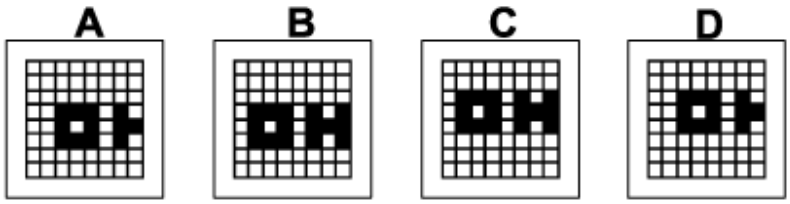


Solution: A

Explanation:
In this question there is a single black dot that rotates around the ring of dots.
The first time it rotates one place clockwise; the next time it rotates two places anticlockwise; the next time 4 places clockwise etc.
The number of places it rotates doubles each time, and the direction of rotation reverses each time.
Following these rules, for the next diagram of the sequence it should rotate 16 places clockwise, and the correct answer is A.

Question 21

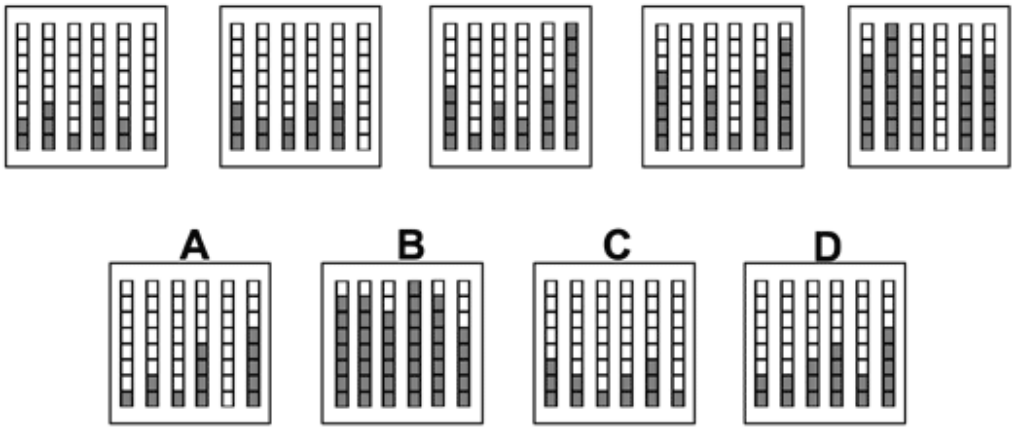
Which of the following replaces the question mark in the sequence?



Solution: D

Explanation:
In this question the squares making up the letters of the word OH move around the grid, moving one place to the right and two places up each time.
Following this rule, the missing diagram of the sequence must be D.

Question 22



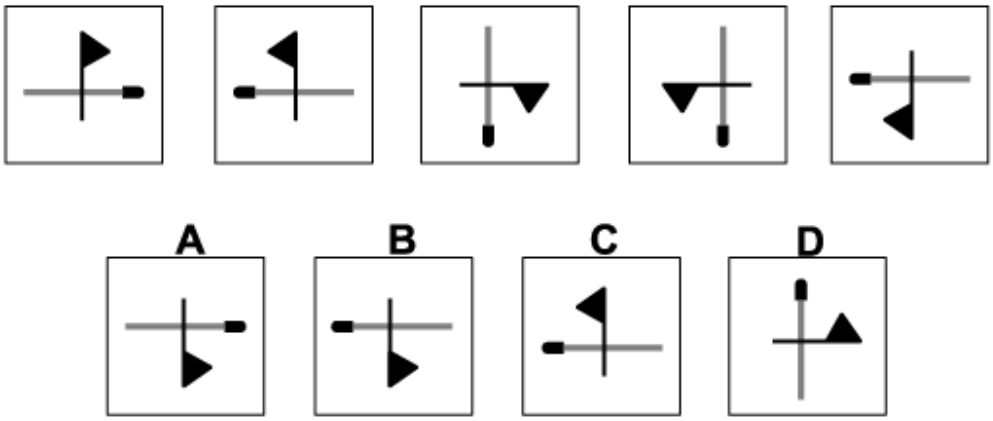
Solution: B

Explanation:
In this question there is one rules to follow.

The rule is that the number of grey squares in the odd-numbered columns increase by 1 while the numbers of grey squares in the even-numbered columns decrease by 1. When the number reaches 0, the column is filled with all-shaded squares and the sequence continues.

Following this rule the next figure in the series is B

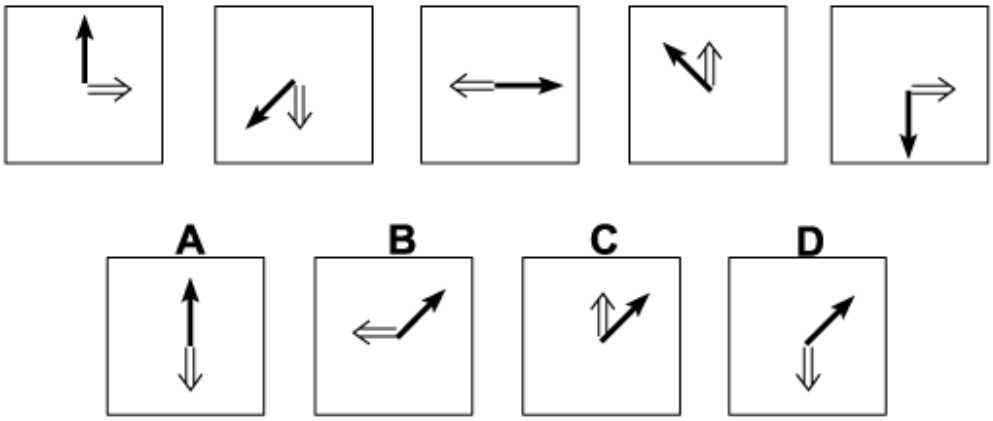
Question 23



Solution: A

Explanation:
In this question there is a flag and a matchstick that are reflected successively in two different axes.
The first axis is the vertical line passing through the centre.
The second axis is the diagonal line stretching from the bottom left corner to the top right corner.
To obtain the next diagram of the sequence, therefore, the flag and matchstick should be reflected in the vertical axis, and the correct answer is A.

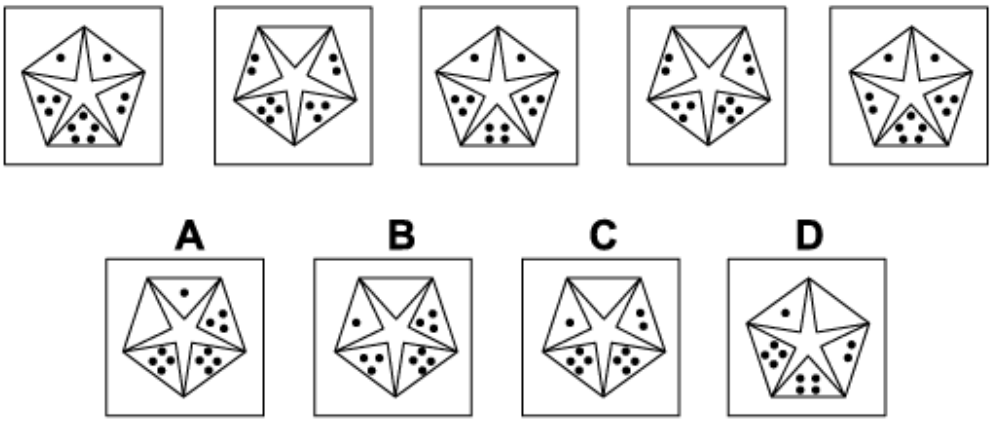
Question 24



Solution: D

Explanation:
In this question there are two different arrows - a single black arrow and a double grey arrow. Each arrow rotates according to its own rule.
The black arrow rotates around the centre by 135° anticlockwise each time. Following this rule, the correct answer could be B, C or D.
The double arrow rotates around the centre by 90° clockwise each time.
Following this rule also, the next diagram of the sequence is D.

Question 25



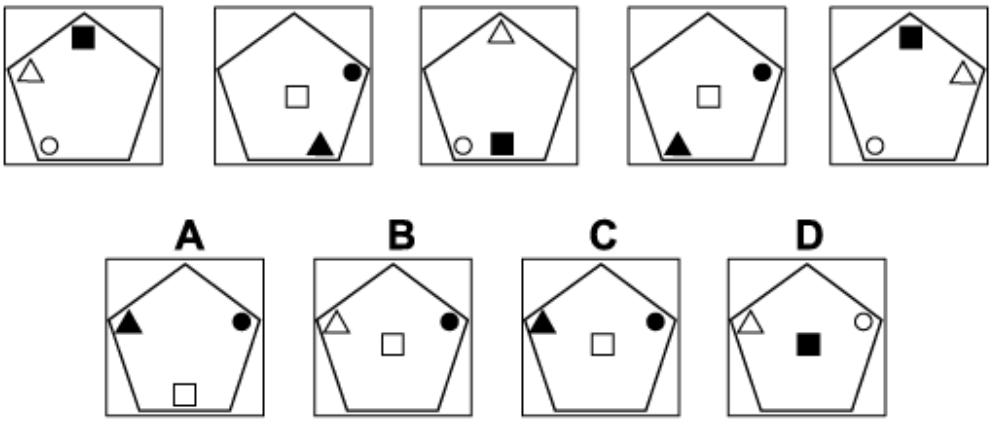
Solution: C

Explanation:
In this question there are two rules to follow that are applied simultaneously.
The first rule is that the pentagon and star rotates by 72° clockwise each time.
The second rule concerns the numbers of dots in each of the five triangles. As the pentagon rotates:

- If the triangle is moving downwards, then the number of dots in the triangle increases by 1.
- If the triangle is moving upwards, then the number of dots in the triangle decreases by 1.

When these two rules are applied simultaneously, the correct answer is C.

Question 26

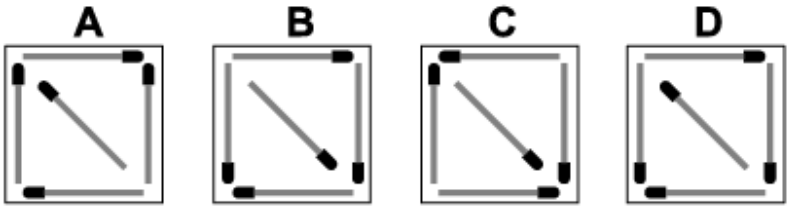


Solution: C

Explanation:
In this question there are three shapes - a triangle, a square and a circle - that move around the pentagon, each according to its own rule.
The triangle rotates around the vertices of the pentagon, rotating by 144° anticlockwise each time.
The square occupies three positions on the vertical axis of the pentagon, moving up and down.
The circle is reflected each time in the axis of symmetry of the pentagon stretching from the top left side to the bottom right vertex.
As well as following these rules, the shapes also change colour from one diagram to the next.
When all of these rules are applied simultaneously, the correct answer is C.

Question 27

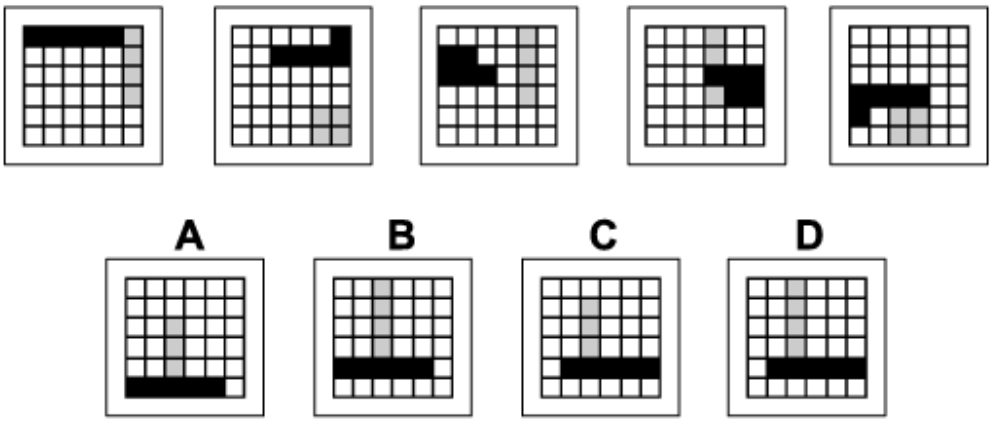
Which of the following replaces the question mark in the sequence?



Solution: B

Explanation:
In this question there are two rules to follow that are applied alternately.
The first rule is that the group of matches is reflected in the diagonal stretching from the bottom left corner to the top right corner.
The second rule is that the group of matches is rotated about the centre by 90° anticlockwise.
To find the missing diagram of the sequence, the first rule should be applied, giving answer B.
When the second rule is applied to answer B, the sequence is continued correctly with the final diagram.

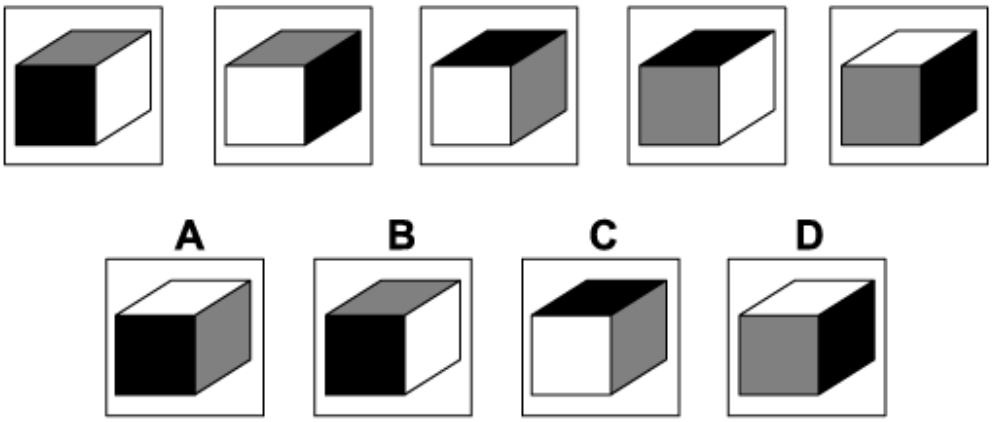
Question 28



Solution: D

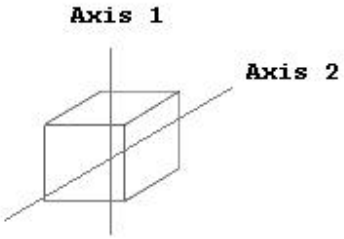
Explanation:
In this question there is a 'train' of five black squares and a 'train' of four grey squares that move around the grid.
The black 'train' starts in the top left corner and zigzags its way down the rows of the grid, moving forwards 5 places each time.
The grey 'train' starts in the top right corner and zigzags its way across the columns of the grid (from left to right), moving forwards 4 places each time.
If the two trains occupy the same square, then only the black is visible.
When these rules are applied, the next diagram of the sequence is D.

Question 29

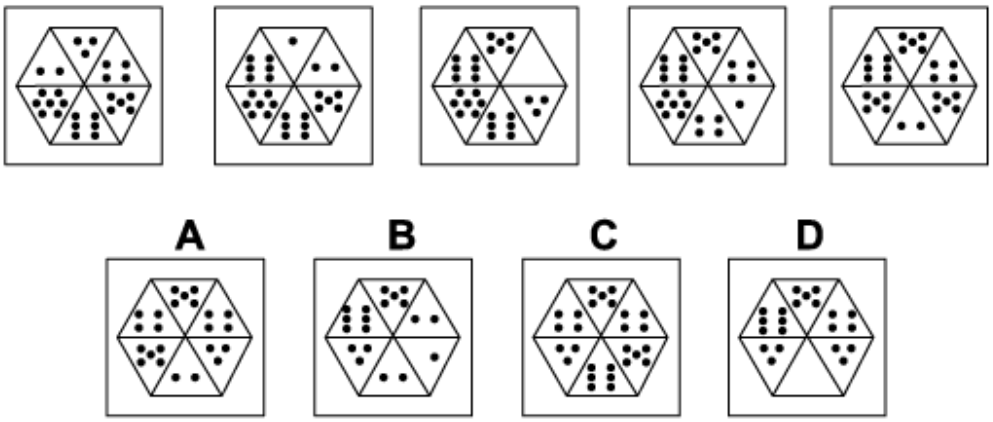


Solution: A

Explanation:
In this question there is a cube with two opposite faces coloured black, two opposite faces coloured grey and two opposite faces coloured white.
The cube rotates alternately around the Axes 1 and 2, as shown in the diagram, by 90° each time.
Following this rule, the next diagram in the sequence must be A.



Question 30



Solution: C

Explanation:
In this question there are two rules to follow that are applied simultaneously.
The first rule is that the hexagon is rotated by 60° clockwise each time.
The second rule is that, after the rotation, the numbers of dots in the top three triangles are each reduced by 1, and the numbers of dots in the bottom three triangles are each increased by 1.
When these two rules are applied simultaneously, the correct answer must be C.

- End of Test 7 -