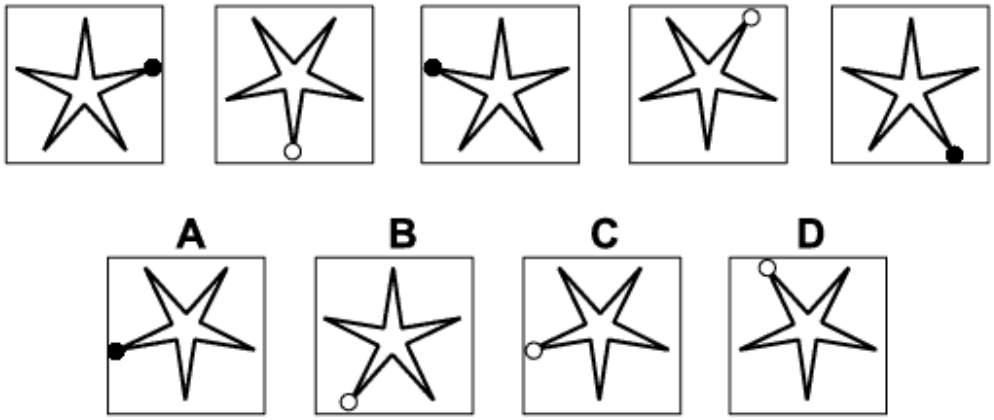
Inductive Reasoning
Practice Test 8

Solution Booklet

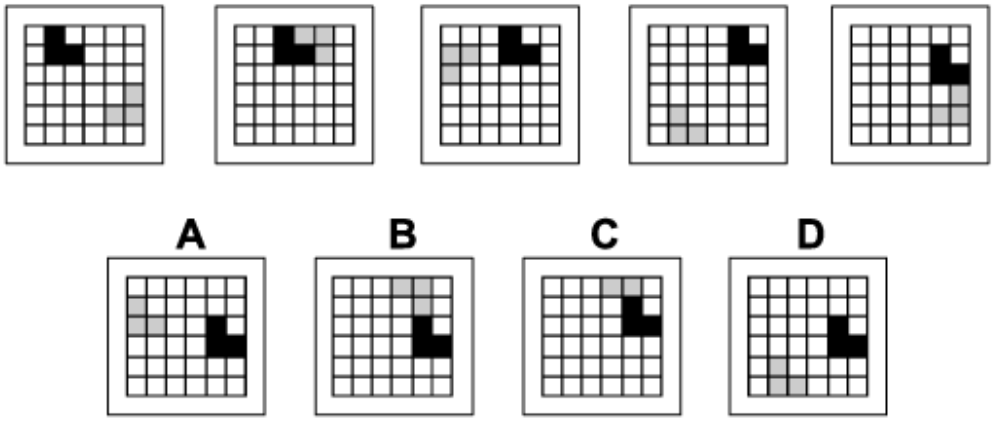
Question 1



Solution: C

Explanation:
In this question there is a pentagonal star with a dot at the tip of one of its points.
There are two rules to follow that are applied simultaneously.
The first rule is that the star and dot are rotated about the centre of the star by 108° clockwise each time.
The second rule is that the dot alternates between black and white.
When these two rules are applied simultaneously, the correct answer is C.

Question 2

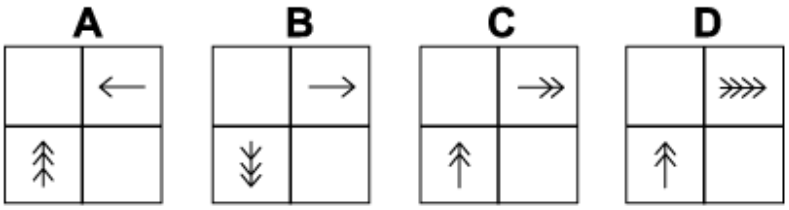


Solution: B

Explanation:
In this question there are two L-shapes, one black and one grey, which move around the grid each according to its own rule.
The black L-shape moves around the perimeter of the grid in a clockwise sense, moving one place around the perimeter each time. When this rule is applied, the correct answer could be A, B or D.
The grey L-shape rotates about the centre of the grid, rotating by 90° anticlockwise each time. When this rule is also applied, the correct answer is B.

Question 3

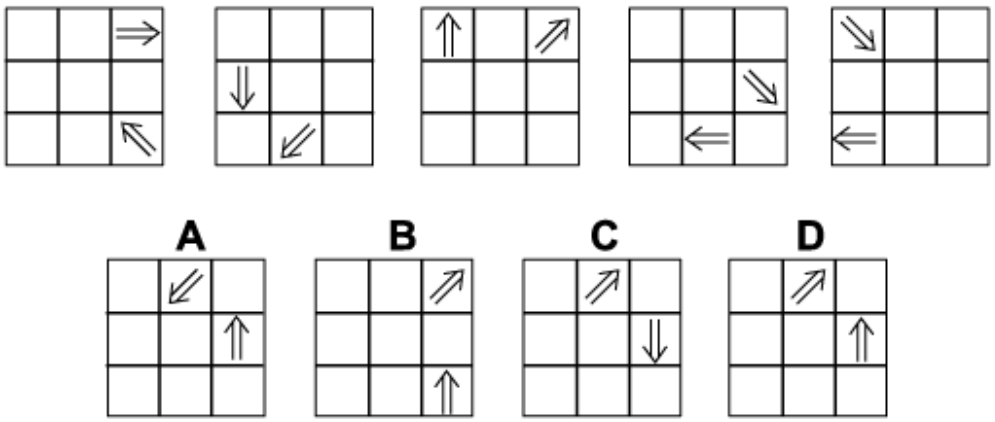
Which of the following replaces the question mark in the sequence?



Solution: A

Explanation:
In this question there are two arrows with a changing number of arrowheads. From one diagram of the sequence to the next both arrows move one place clockwise around the four squares. But each of them also has its own rule to follow.
The arrow that starts in the top right corner of the grid is also itself rotated by 90° clockwise each time, while the number of arrowheads changes according to the pattern $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 1$.
The arrow that starts in the bottom left corner of the grid is rotated by 90° anticlockwise each time, while the number of arrowheads changes according to the pattern $3 \rightarrow 4 \rightarrow 1 \rightarrow 2 \rightarrow 3$.
When these rules are followed simultaneously, the missing diagram of the sequence must be A.

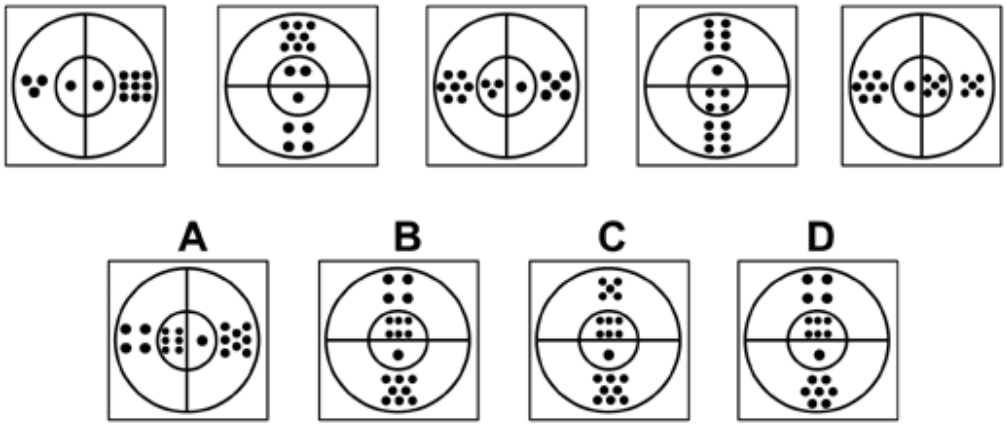
Question 4



Solution: D

Explanation:
In this question there are two arrows that both move clockwise around the outside of the grid following an 'L'-shaped rule like the knight's move in chess i.e. two squares in one direction and one square in the other direction. Following this rule, the correct answer could be A, C or D.
At the same time each of the arrows rotates about its own centre:
The arrow that starts in the top right corner of the grid, rotates about its centre by 135° clockwise each time.
The arrow that starts in the bottom right corner of the grid, rotates about its centre by 135° anticlockwise each time.
When these rules are also applied, the correct answer is D.

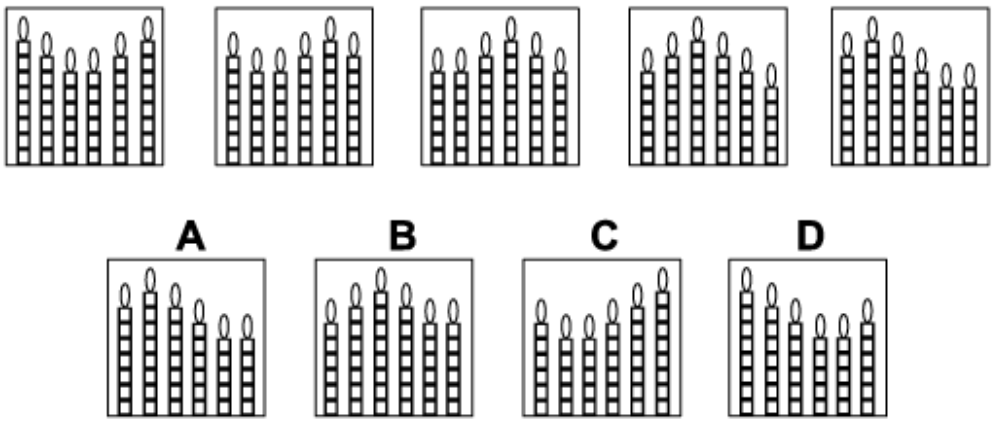
Question 5



Solution: B

Explanation:
In this question there are two concentric circles divided into semicircles. Each of the four segments thus formed contains a number of dots.
For one outer segment and the opposite inner segment, the number of dots increases by one each time.
For the other outer segment, the number of dots decreases by one each time.
The remaining inner segment always has just one dot.
At the same time the two circles are rotated each time by 90° anticlockwise.
When all of these rules are applied simultaneously, the correct answer must be B.

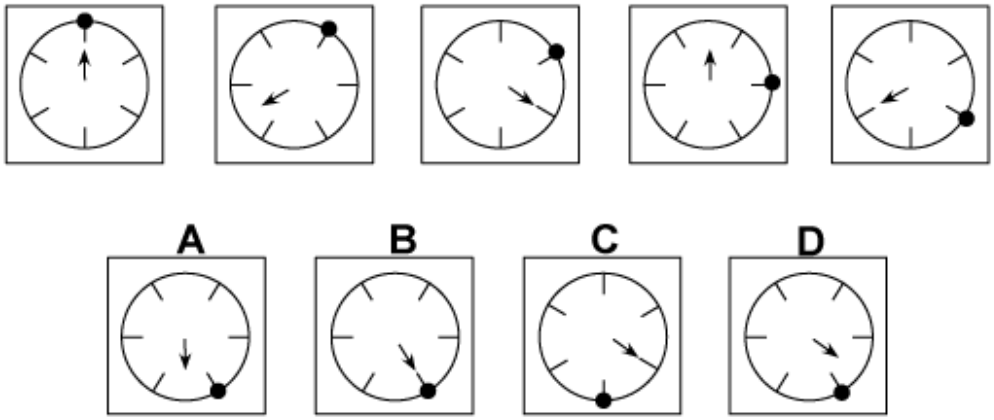
Question 6



Solution: D

Explanation:
In this question there are six candles, each divided into equal parts with a maximum of eight. From one diagram to the next, the candle on the far left is reduced in height by one part and then moved to the far right of the group, while the other five candles each move one place to the left. When this rule is applied, the correct answer is D.

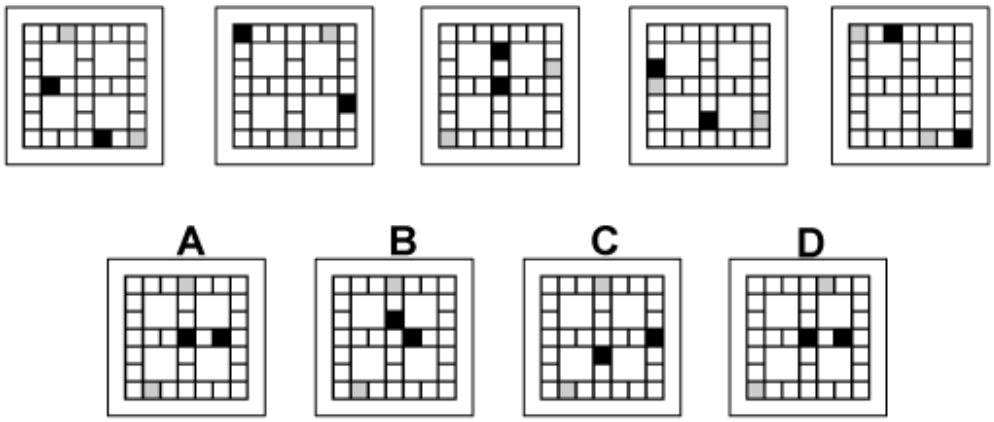
Question 7



Solution: D

Explanation:
In this question there is a dial with a dot, and an arrow, that both rotate around the centre of the dial.
The dial itself rotates by 30° clockwise each time. When this rule is applied, the correct answer could be A, B or D.
At the same time the arrow rotates relative to the dial by 150° anticlockwise each time, so it effectively rotates by 120° anticlockwise each time. When this rule is also applied, the correct answer must be D.

Question 8

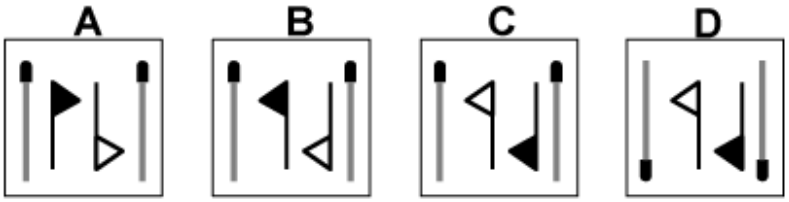


Solution: A

Explanation:
In this question there is a grid of squares. Two of the squares are coloured grey and two are coloured black. The grey and black squares each move around a different circuit according to their own rule.
The grey squares move around the 24 squares that make up the perimeter of the grid, moving by three squares clockwise each time. When this rule is applied, the correct answer could be A, B or C.
The black squares rotate around a circuit in the shape of a number 8 consisting of the squares in the top left corner of the grid and the squares in the bottom right corner of the grid. They move four squares forward each time - in the top left corner they move clockwise; in the bottom right corner, they move anticlockwise. When this rule is also applied, the correct answer is A.

Question 9

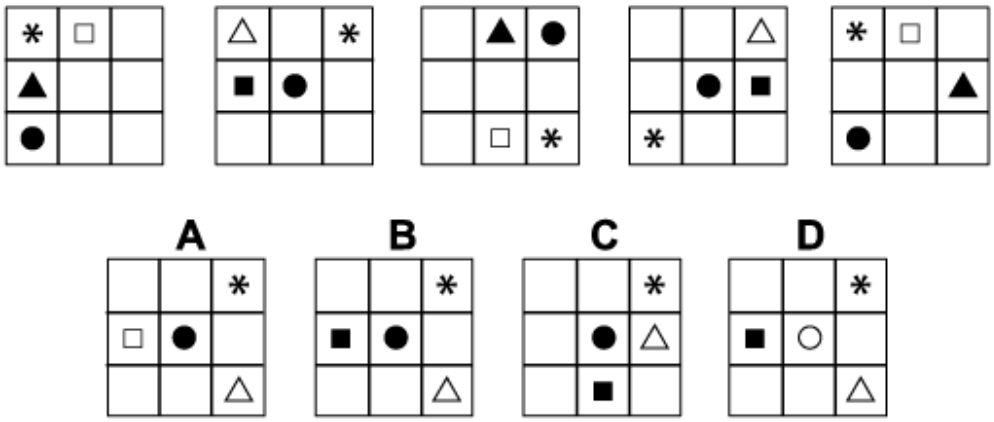
Which of the following replaces the question mark in the sequence?



Solution: C

Explanation:
In this question there are two rules that are applied alternately.
The first rule is that the group of matchsticks and flags is reflected in the diagonal stretching from the top left corner to the bottom right corner.
The second rule only affects the flags. The matchsticks stay where they are while the flags are rotated about the centre by 180°.
To obtain the missing diagram of the sequence, therefore, the first rule should be applied next, and the correct answer is C.

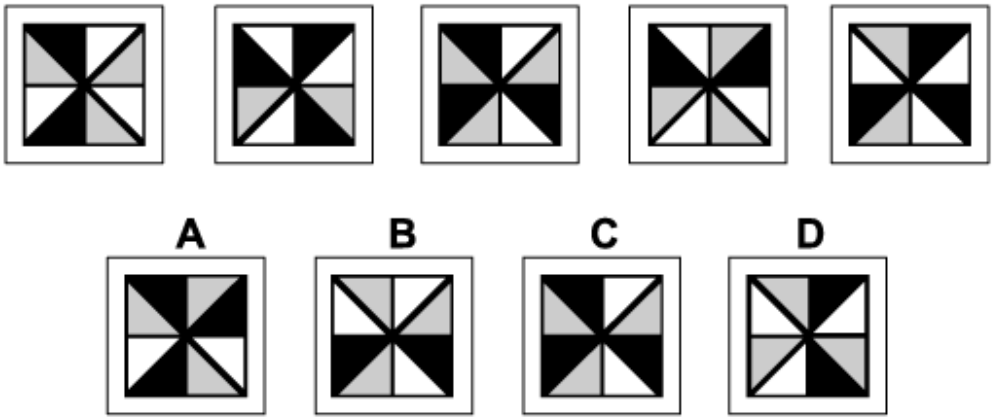
Question 10



Solution: B

Explanation:
In this question there are four shapes - an asterisk, a dot, a square and a triangle which move around the grid each according to its own rule.
The asterisk moves clockwise around the four corners of the grid.
The dot moves up and down the diagonal stretching from the bottom left corner to the top right corner, moving one place up or down each time.
The square rotates anticlockwise around the four squares at the centre of each edge of the grid. It also alternates between white and black.
The triangle rotates clockwise around the 8 squares on the perimeter of the grid, moving one place each time. It also alternates between black and white.
When all these rules are applied simultaneously, the correct answer is B.

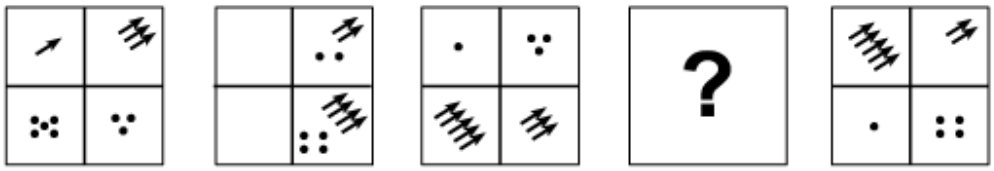
Question 11



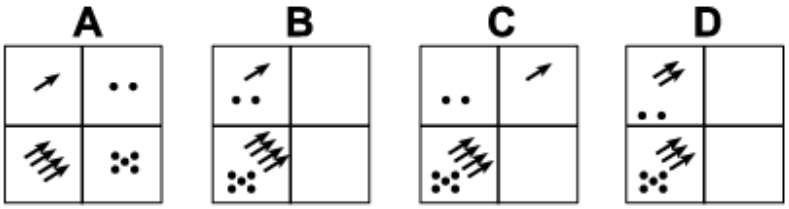
Solution: A

Explanation:
In this question there are two rules that are applied simultaneously.
The first rule is that the square of triangles is rotated by 90° anticlockwise each time.
The second rule is that the colours of the triangles change as follows - black changes to grey, grey changes to white and white changes to black.
When these two rules are applied simultaneously, the next diagram in the sequence is A.

Question 12



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

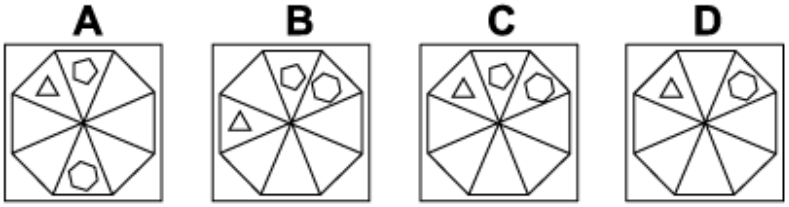


Solution: B

Explanation:
In this question there are two groups of dots and two groups of arrows.
The dots rotate one place anticlockwise around the grid each time and the number of dots follows the pattern 5 → 4 → 3 → 2 → 1 → 5 etc.
The arrows rotate one place clockwise around the grid each time and the number of arrows follows the pattern 1 → 2 → 3 → 4 → 5 → 1 etc.
When both these rules are applied simultaneously to both sets of dots and arrows, the correct answer for the missing diagram of the sequence must be B.

Question 13

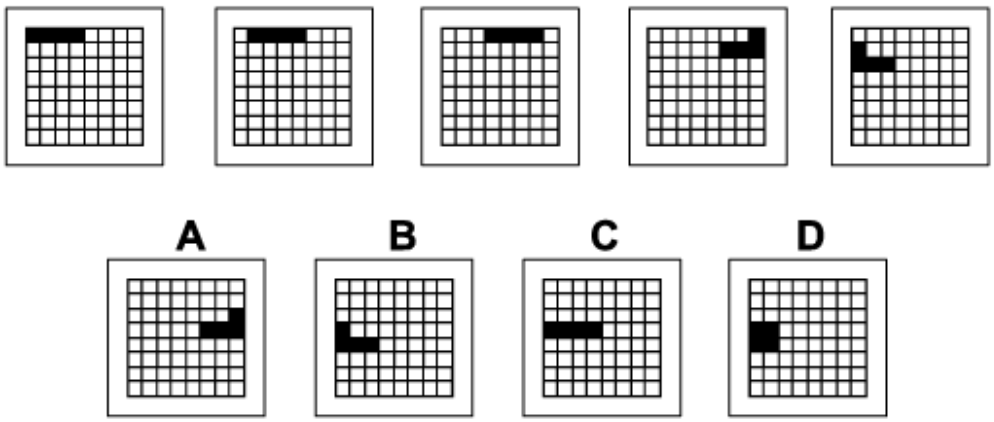
Which of the following replaces the question mark in the sequence?



Solution: C

Explanation:
In this question there is a triangle, a pentagon and a hexagon that rotate around the eight triangles that make up a regular octagon, each according to its own rule.
The triangle always rotates by 3 places clockwise. When this rule is applied, the correct answer for the missing diagram of the sequence could be A, C or D.
The pentagon always rotates five places clockwise. When this rule is also applied, the correct answer for the missing diagram of the sequence could be A or C.
The hexagon always rotates six places anticlockwise. When this rule is also applied, the correct answer for the missing diagram of the sequence must be C.

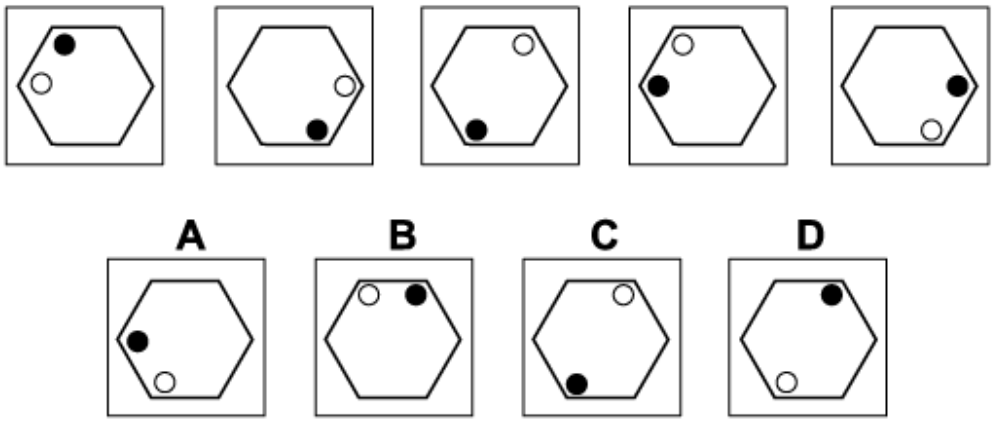
Question 14



Solution: B

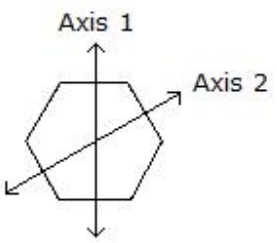
Explanation:
In this question there is a 'train' of four black squares that zigzags its way down the rows of the grid.
The first time, the train' moves forwards 1 place, the second time 2 (= 2^1) places, the third time 4 (= 2^2) places, etc. The number of places it moves forwards doubles each time.
For the next diagram of the sequence, therefore, it should move forward 16 (= 2^4) places, and the correct answer is B.

Question 15

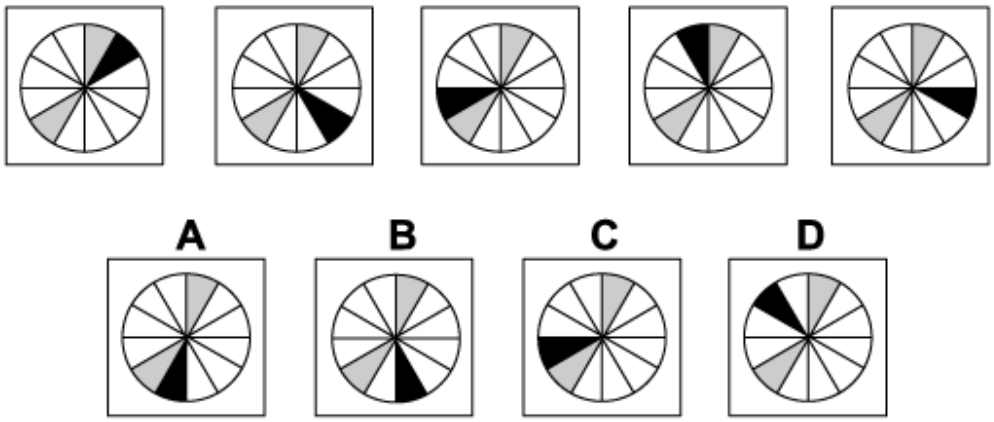


Solution: D

Explanation:
In this question there is a white dot and a black dot that are reflected alternately in each of two different axes.
The white dot is reflected in axis 1 first, then axis 2, then axis 1 etc.
The black dot is reflected in axis 2 first, then axis 1, then axis 2 etc.
To obtain the next diagram of the sequence, therefore, the white dot should be reflected in axis 1 and the black dot should be reflected in axis 2, and the correct answer is D.



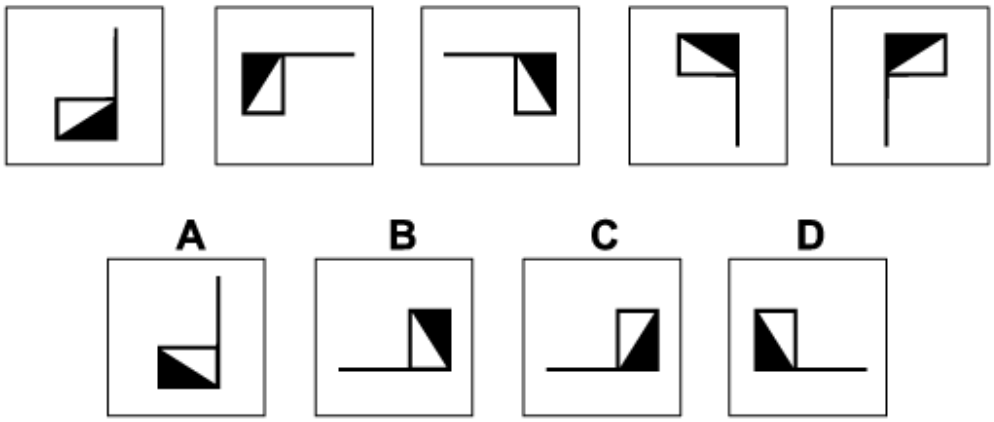
Question 16



Solution: A

Explanation:
In this question the circle is divided up into twelve sectors. Two of the sectors are coloured grey, and they do not move.
There is one black sector that always moves three places clockwise, except when it encounters a grey sector; in which case it 'jumps' the grey sector as one of its three moves.
When this rule is applied, the correct answer must be A.

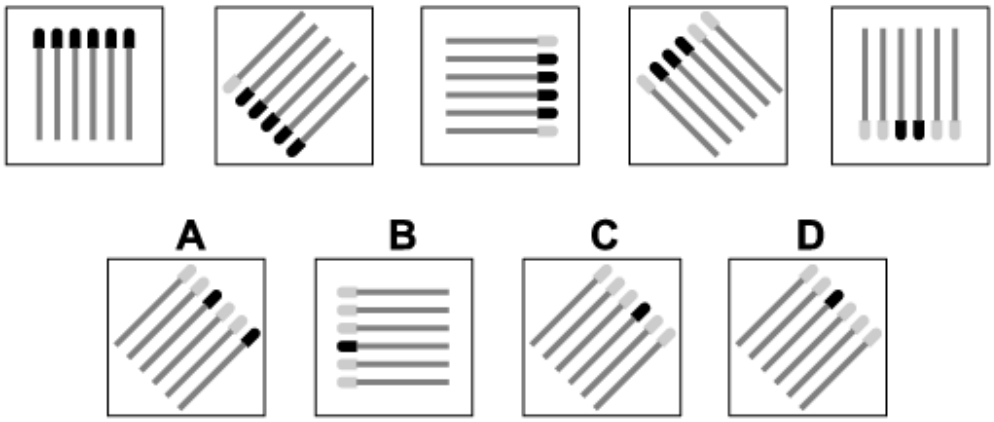
Question 17



Solution: C

Explanation:
In this question the flag is reflected alternately in two different axes. The first axis is the diagonal stretching from the bottom left corner to the top right corner. The second axis is the vertical axis through the centre.
To obtain the next diagram of the sequence, therefore, the flag should be reflected in the first axis next, and the correct answer is C.

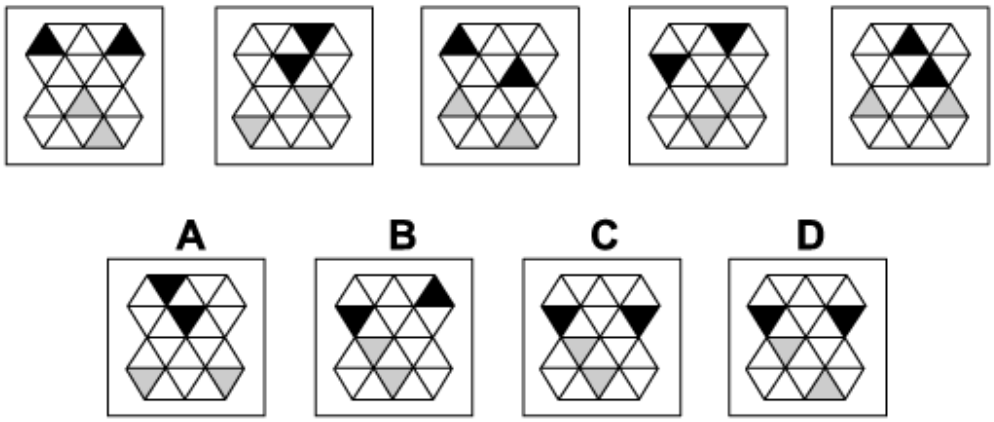
Question 18



Solution: D

Explanation:
In this question there is a group of six matchsticks that are coloured black (live) or grey (spent). There are two rules to follow. The first rule is that the group of matchsticks is rotated by 135° anticlockwise each time. When this rule is applied, the correct answer could be A, C or D.
The second rule is that one more matchstick is spent each time, starting with the matchstick that is positioned at the far right in the first diagram, then the matchstick at the far left, then the next one on the right, etc. When this rule is also applied, the correct answer must be D.

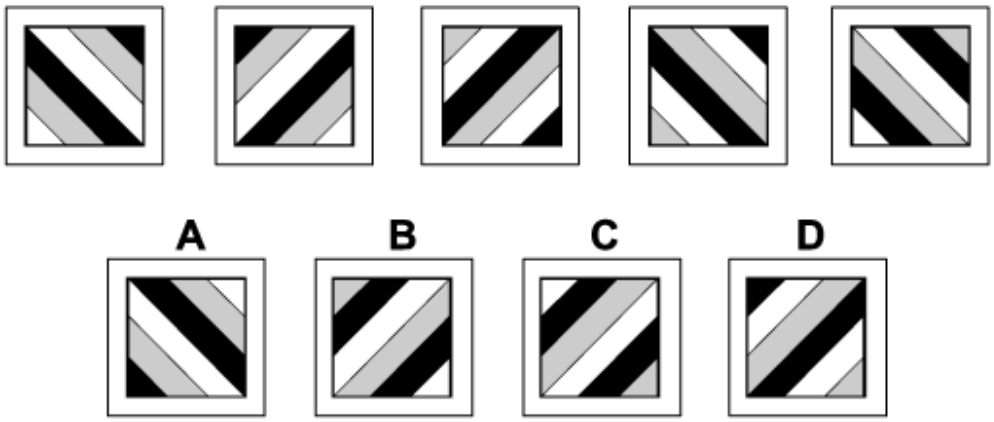
Question 19



Solution: C

Explanation:
In this question there is a shape made up of equilateral triangles that consists of two circuits - in the upper and lower halves of the diagram.
There are also two black triangles and two grey triangles that move each according to their own rule.
The two black triangles move around the top circuit, moving three places clockwise each time. When this rule is applied, the correct answer could be C or D.
The two grey triangles move around the bottom circuit, moving three places anticlockwise each time. When this rule is also applied, the correct answer must be C.

Question 20

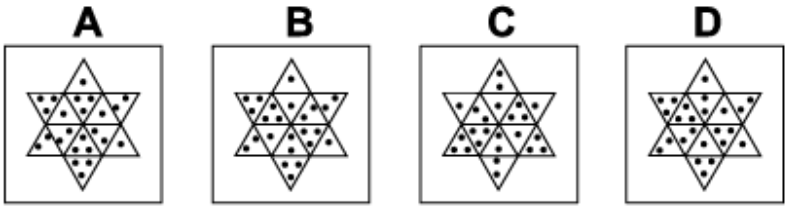


Solution: B

Explanation:
In this question there are two rules that are applied alternately.
The first rule is a 90° anticlockwise rotation.
The second rule is that the colours change as follows: black → grey, grey → white, and white → black.
To obtain the next diagram of the sequence, therefore, the first rule should be applied next, and the correct answer is B.

Question 21

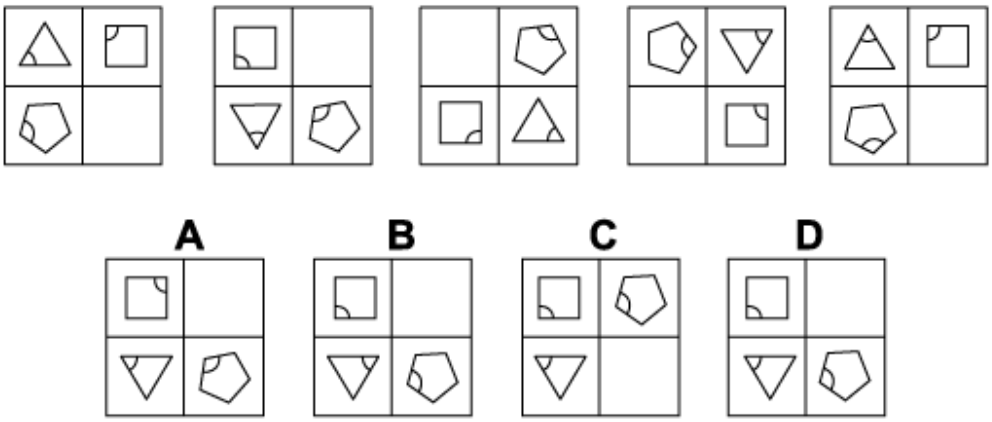
Which of the following replaces the question mark in the sequence?



Solution: A

Explanation:
In this question there are two circuits of equilateral triangles containing dots. Each circuit rotates according to its own rule.
The six triangles in the outer circuit rotate by 120° anticlockwise each time. When this rule is applied, the missing diagram of the sequence could be A, B or D.
The six triangles in the inner circuit rotate by 60° clockwise each time. When this rule is also applied, the missing diagram of the sequence must be A.

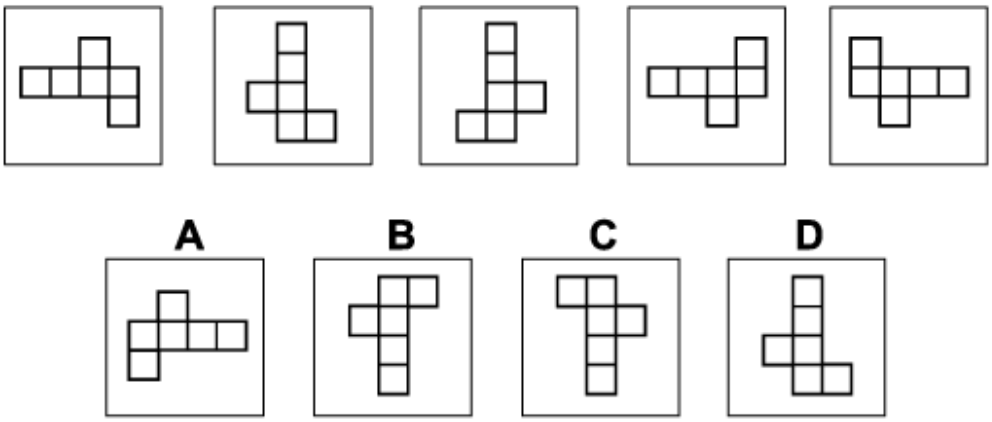
Question 22



Solution: D

Explanation:
In this question the equilateral triangle, the square and the regular pentagon rotate around the four corners of the grid by 90° anticlockwise each time. When this rule is applied, the correct answer could be A, B or D.
At the same time, each of the three shapes rotates around its own centre:
The equilateral triangle rotates around its centre by 60° anticlockwise each time.
The square rotates around its centre by 90° anticlockwise each time.
The regular pentagon rotates around its centre by 72° clockwise each time.
When all these rules are applied simultaneously, the next diagram of the sequence must be D.

Question 23



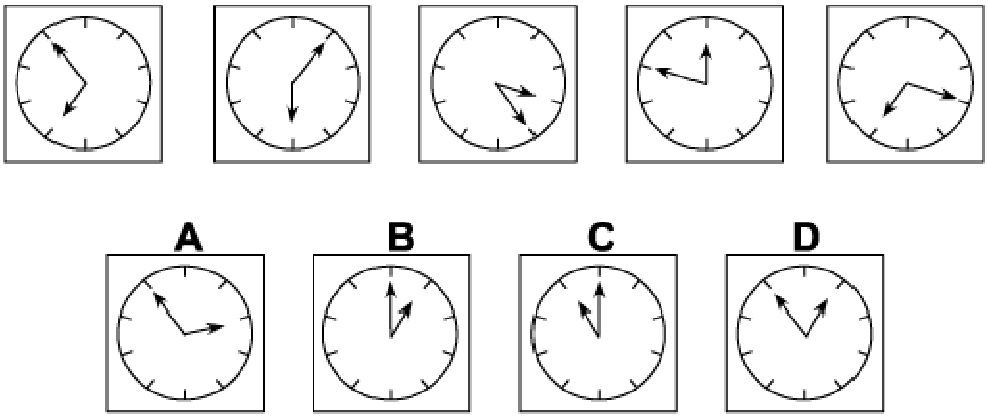
Solution: C

Explanation:
In this question the shape is reflected alternately in two axes:

1. The first axis is the diagonal stretching from the top right corner of the square to the bottom left corner.
2. The second axis is the vertical axis passing through the centre of the square.

For the next diagram of the sequence, therefore, the shape should be reflected in the first axis next, and the correct answer is C.

Question 24

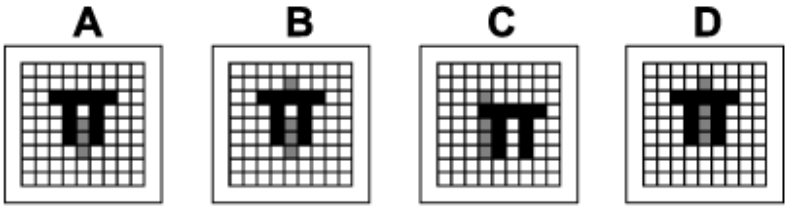


Solution: D

Explanation:
In this question there is a clock with 10 divisions rather than the usual 12, so the angle between each pair of divisions is 36°.
The small hand of the clock rotates successively anticlockwise by 36°, 72°, 108°, etc.
The big hand of the clock rotates successively clockwise by 72°, 108°, 144° etc.
Therefore, for the next diagram of the sequence, the small hand should rotate anticlockwise by 5 $\times$ 36° = 180°, and the big hand should rotate clockwise by 6 $\times$ 36° = 216°.
The correct answer, therefore, is D.

Question 25

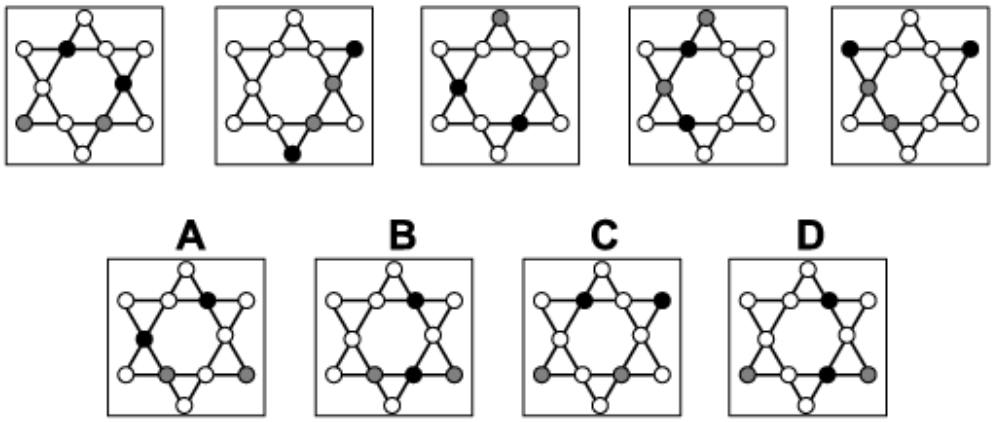
Which of the following replaces the question mark in the sequence?



Solution: A

Explanation:
In this question there is a letter **π** and a letter **i** that move across the grid, each according to its own rule.
The **π** moves one square to the right and one square down each time.
The **i** moves two squares to the left and one square up each time.
When these rules are applied, the missing diagram of the sequence is A.
(Note that the dot of the **i** is obscured by the top part of the **π**.)

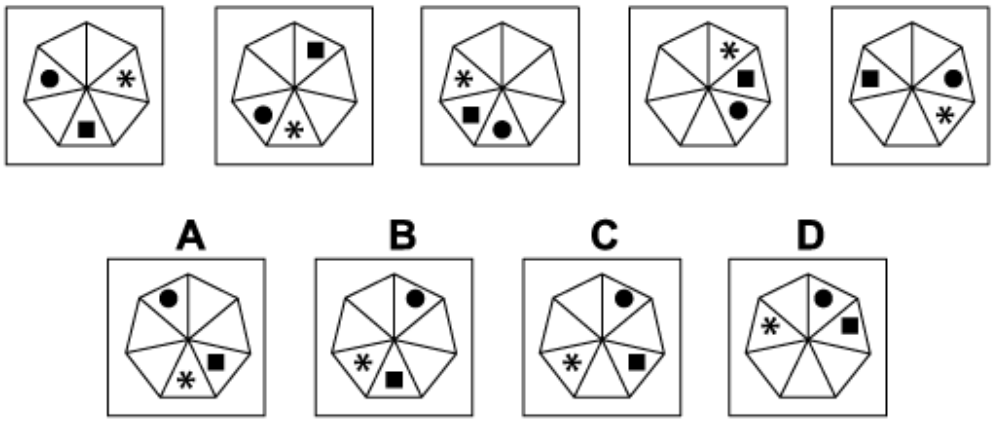
Question 26



Solution: B

Explanation:
In this question there are two triangular circuits each consisting of nine circles, one circuit being upright, the other upside down.
There are two black dots that move around the upside down circuit, moving two places clockwise each time.
There are two grey dots that move around the upright circuit, moving two places anticlockwise each time.
When these rules are applied simultaneously, the correct answer is B.

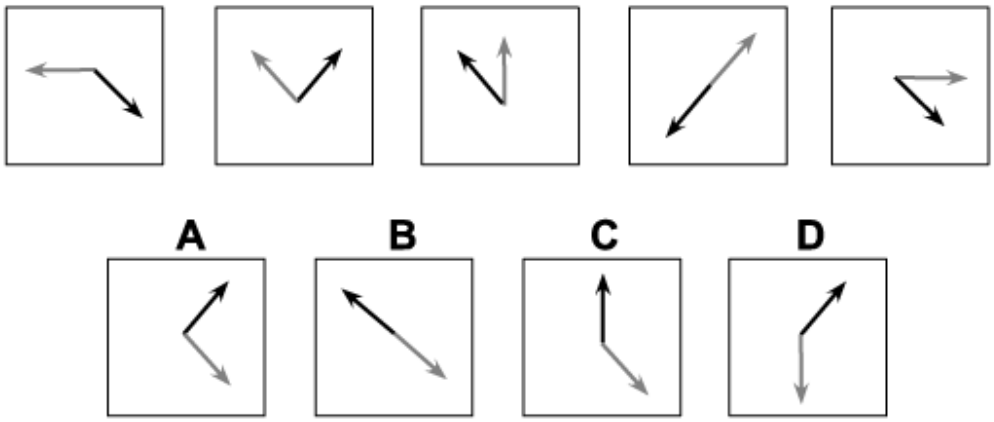
Question 27



Solution: C

Explanation:
In this question there is a circle, a square and an asterisk that move around the seven triangles that make up a regular heptagon. Each shape moves according to its own rule.
The circle moves one place anticlockwise each time. When this rule is applied, the correct answer could be B, C or D.
The square moves four places clockwise each time.
The asterisk moves five places anticlockwise each time.
When these rules are also applied, the next diagram of the sequence is C.

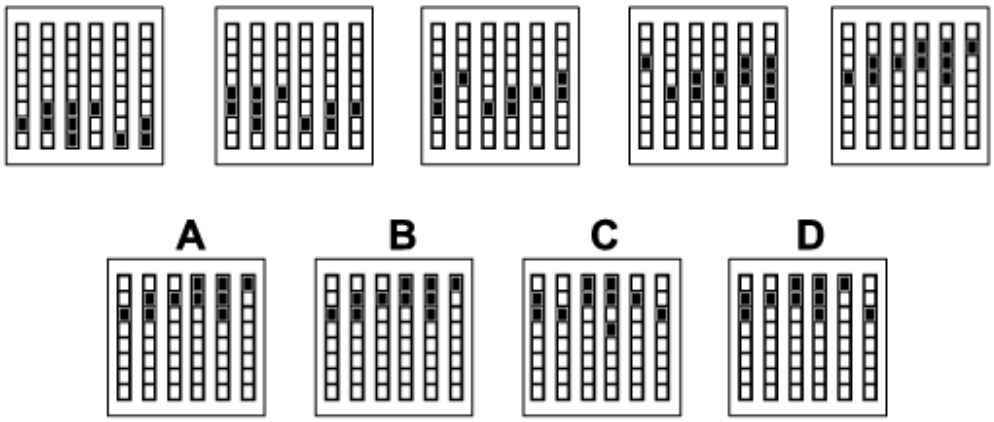
Question 28



Solution: A

Explanation:
In this question there is a grey arrow and a black arrow that rotate around the centre of the square.
The grey arrow rotates each time by 45° clockwise. When this rule is applied, the correct answer could be A, B or C.
The black arrow rotates each time by 90° anticlockwise. When this rule is also applied, the correct answer must be A.

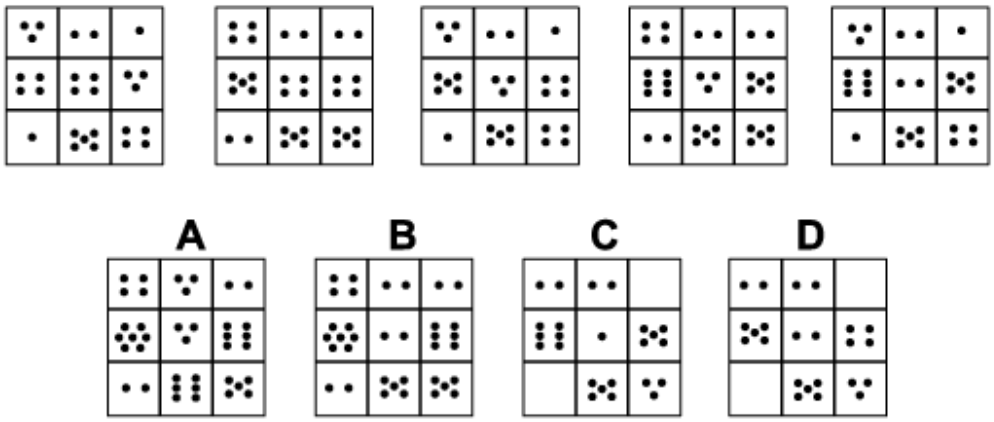
Question 29



Solution: D

Explanation:
In this question there are six columns of squares. Some squares in each column are coloured black. There are two rules to follow that are applied simultaneously.
The first rule is that all the black squares in all columns move up one place each time.
The second rule is that the column on the far left is moved to the far right, while the other columns do not move.
When these two rules are applied simultaneously, the correct answer is D.

Question 30



Solution: B

Explanation:
In this question there are two rules to follow that are applied alternately.
The first rule is that the numbers of dots in the first and third columns are increased by 1 each, while the numbers of dots in the middle column remain the same.
The second rule is that the numbers of dots in the squares on the two diagonals each decrease by 1, while the numbers of dots in the other four squares remain the same.
To obtain the next diagram of the sequence, therefore, the first rule should be applied next, and the correct answer is B.

- End of Test 8 -