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Non Verbal Reasoning – Part 2

PAPER FOLDING

In each of the following problems, a square transparent sheet (X) with a pattern is given. Figure out from amongst the four alternatives as to how the patter would appear when the transparent sheet is folded at the dotted line.

1. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



2. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



3. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.







C. 3

D. 4

Answer: Option D

4. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



5. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



6. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.









8. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



9. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



10. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.





12. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



13. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



14. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.







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C. 3

D. 4

Answer: Option D

5. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



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- Answer: Option D
- 8. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



C. 3

D. 4

Answer: Option D

9. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



10. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



Construction of Boxes:

The details of the cube formed when a sheet is folded to form a box:

Form I 1 2 3 4 5 6	In this case: 1 lies opposite 5; 2 lies opposite 4; 3 lies opposite 6.	
Form II 1 2 3 4 5 6	In this case: 1 lies opposite 6; 2 lies opposite 4; 3 lies opposite 5.	
Form III	In this case: 1 lies opposite 4;	
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1 2 3 4 5 6	2 lies opposite 6; 3 lies opposite 5.
Form IV	In this case,
FORMIV	1 lies opposite 4:
	2 lies opposite 5:
2 3	3 lies opposite 6
4 5	
6	
Form V	In this case:
	1 lies opposite 3
	2 lies opposite 5:
2	4 lies opposite 6.
3 4	
5	
6	
Form VI	In this case:
1	i will be the one of the faces of the cube and it lies opposite
	3;
	2 lies opposite 4;
Ŷ	1 lies opposite 5.
Form VII	In this case:
±	
1	will be the one of the faces of the cube and it lies opposite
	3; O lice ennosite 4:
5	2 lies opposite 4,
×	Thes opposite 5.
Form VIII	In this case:
1	
	I and I are two toog of the sube that he encoute to each
- 2	the and the are two faces of the cube that lie opposite to each other
	other.
3	and L are two faces of the cube that lie opposite to each other. lies opposite 3; lies opposite 4:

The sheet of paper shown in the figure (X) given on the left hand side, in each problem, is folded to form a box. Choose from amongst the alternatives (1), (2), (3) and (4), the boxes that are similar to the box that will be formed.



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1. Choose the box that is similar to the box formed from the given sheet of paper (X).



- **B.** 2 and 4 only
- **C.** 2 and 3 only
- **D.** 1 and 4 only

Answer: Option C Explanation:

The fig. (X) is similar to the **Form VI**. So, when a cube is formed by

folding the sheet shown in fig. (X), then \square is one of the faces of the cube. However, the cube in fig. (1) has two such faces and fig. (4) has a face which is completely shaded. So, these two cubes cannot be formed. Hence, only the cubes in figures (2) and (3) can be formed.

2. Choose the box that is similar to the box formed from the given sheet of paper (X).



Answer: Option A Explanation:

The fig. (X) is similar to the **Form I**. So, when the sheet shown in fig. (X) is folded to form a cube then one of the two half-shaded faces lies opposite to one of the blank faces and the other half-shaded face lies opposite to another blank face. The two remaining blank faces lie opposite to each other. Thus, both the cubes shown in figures (1).and (4) can be formed when the sheet shown in fig. (X) is folded. Also, though the cubes shown in figures (2) and (3) have faces that can appear



adjacent to each other but the cube formed by folding the sheet in fig. (X) cannot be rotated to form either of the two. Hence, the cubes in figures (2) and (3) cannot be formed.

3. How many dots lie opposite to the face having three dots, when the given figure is folded to form a cube?



Answer: Option D Explanation:

The given figure is similar to **Form V**. Therefore, when this figure is folded to form a cube then the face bearing six dots will lie opposite the face bearing three dots.

4. Choose the box that is similar to the box formed from the given sheet of paper (X).



Answer: Option A Explanation:

The fig. (X) is similar to **Form II**. So, when the sheet shown in fig. (X) is folded to form a cube then the two half-shaded faces lie opposite to each other, the face bearing a circle lies opposite to one of the two blank faces and the two remaining blank faces lie opposite to each other. Therefore, the cubes shown in fig. (4) which has the two half-shaded faces adjacent to each other, cannot be formed by folding the sheet shown in fig. (X). Also, the cube shown in fig. (2) has the face bearing a circle adjacent to two blank faces. This is not possible since there is one blank face



opposite to the circle and one blank face opposite to the third blank face. Hence, only the cubes in figures (1) and (3) can be formed.

5. Choose the box that is similar to the box formed from the given sheet of paper (X).



Explanation:

The fig. (X) is similar to **Form II**. So, when a cube is formed by folding the sheet shown in fig. (X), then the two half-shaded faces lie opposite to each other and one. of the three blank faces appears opposite to the face bearing a dot. Clearly, each one of the four cubes shown in figures (1), (2), (3) and (4) can be formed by folding the sheet shown in fig. (X).

6. Choose the box that is similar to the box formed from the given sheet of paper (X).



- **B.** 1 and 3 only
- **C.** 1, 3 and 4 only
- **D.** 1, 2, 3 and 4

Answer: Option C

Explanation:

When the sheet in fig. (X) is folded, then one of the faces of the cube

formed will be of the form **and** this face will lie opposite the face bearing a square. Also, one of the blank faces lies opposite another blank face and the third blank face lies opposite the face bearing an '=' sign. Clearly, all the three blank faces cannot appear adjacent to each other.



So, the cube shown in fig. (2) which has all the three blank faces adjacent to each other cannot be formed. Hence, only the cubes shown in figures A, C and D can be formed.

7. Choose the box that is similar to the box formed from the given sheet of paper (X).



Explanation:

The fig. (X) is similar to the **Form III**. So, when the sheet in fig. (X) is folded to form a cube, then 'F' appears opposite 'B', 'E' appears opposite 'C' and 'A' appears opposite 'D' Therefore, the cube in fig. (1) which shows 'F' adjacent to 'B' the cube in fig. (3) which shows 'E' adjacent to 'C' and the cube in fig. (4) which shows 'A' adjacent to 'D' cannot be formed. Hence, only the cube in fig.(2) can be formed.

8. Choose the box that is similar to the box formed from the given sheet of paper (X).



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folded to form a cube, then the half-shaded face appears opposite to the face bearing a rhombus, the face with a black circle appears opposite to one of the two blank faces and the face with a '+' sign appears opposite to the other blank face. Clearly, the cubes shown in figures (1) and (4) cannot be formed since they have the half-shaded face adjacent to the face bearing the rhombus. Also, though the cube shown in fig. (3) has faces that can appear adjacent to each other but the cube formed by folding the sheet in fig. (X) cannot be rotated to form fig. (3). Hence, the cube in fig. (3) cannot be formed. Thus, only the cube shown in fig. (2) can be formed.

9. Choose the box that is similar to the box formed from the given sheet of paper (X).



Explanation:

The fig. (X) is similar to the **Form II**. So, when the sheet shown in fig. (X) is folded to form a cube then the two half-shaded faces lie opposite to each other, the face bearing a square lies opposite to one of the two blank faces and the face bearing a circle lies opposite to the other blank face. Therefore, the cubes shown in figures (2) and (3) which have the two half-shaded faces adjacent to each other, cannot be formed by folding the sheet shown in fig. (X). Also, though the cube shown in fig. (4) has faces that can appear adjacent to each other but the cube formed by folding the sheet in fig. (X) cannot be rotated to form the cube in fig. (4). Hence, only the cube in fig. (1) can be formed.



10. Choose the box that is similar to the box formed from the given sheet of paper (X).



Explanation:

The fig. (X) is similar to the **Form V**. So, when the sheet in fig. (X) is folded to form a cube, then the face bearing a dot lies opposite to one of the shaded faces. Therefore, the cube shown in fig. (2) which has both the shaded faces adjacent to the face bearing the dot, cannot be formed. Hence, the cubes shown in figures (1), (2) and (4) can be formed.

11. Choose the box that is similar to the box formed from the given sheet of paper (X).



- **C.** 1, 3 and 4 only
- **D.** 2, 3 and 4 only

Answer: Option D Explanation:

The fig. (X) is similar to the **Form VII**. So, when a cube is formed by folding the sheet shown in fig. (X), then is one of the faces of the cube and this face lies opposite to a blank face. Also, a face bearing a square lies opposite to another blank face. The remaining two blank faces lie opposite to each other. Clearly, in the cube shown in fig. (1), the



face consisting of the four symbols is not the same as that formed (as shown above). Hence, the cube in fig. (1) cannot be formed.

12. Choose the box that is similar to the box formed from the given sheet of paper (X).



The fig. (X) is similar to the **Form VI**. So, when a cube is formed by

folding the sheet shown in fig. (X), then \bowtie is one of the faces of the cube and this face lies opposite to a blank face. Also, a face bearing a circle lies opposite to one bearing a dot. Clearly, this cube does not have faces as shown in the cubes in figures (3) and (4). Hence, only the cubes shown in figures (1) and (2) can be formed.

13. Choose the box that is similar to the box formed from the given sheet of paper (X).





(2)





A. 1 and 3 only

B. 2, 3 and 4 only

(1)

- **C.** 2 only
- **D.** 3 and 4 only

Answer: Option **C**

Explanation:

The fig. (X) is similar to the **Form I**. So, when the sheet in fig. (X) is folded to form a cube, then the completely shaded face lies opposite to the half shaded face. Therefore, the cubes shown in figures (1) and (3)



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which have the completely shaded face adjacent to the half-shaded face cannot be formed. Since Fig 4 does't have at-least one shaded face, it cannot be formed. Hence, only the cubes in figure (2) can be formed.

14. Choose the box that is similar to the box formed from the given sheet of paper (X).



Explanation:

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The fig. (X) is similar to the **Form V**. So, when the sheet shown in fig. (X) is folded to form a cube then the shaded face lies opposite to one of the blank faces, the face bearing a circle lies opposite to another blank face and the face bearing a shaded square lies opposite to the third blank face. Thus, each one of the cubes shown in figures (1), (2) and (4) can be formed. Also, though the cube shown in fig. (3) has faces that can appear adjacent to each other but the cube formed by folding the sheet in fig. (X) cannot be rotated to form fig. (3). Hence, the cube in fig.(3) cannot be formed.

15. Choose the box that is similar to the box formed from the given sheet of paper (X).



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folded to form a cube, then the face bearing a square lies opposite to the face bearing a circle. Therefore, the cubes shown in figures (1) and (2) which have the faces bearing the square and the circle adjacent to each other, cannot be formed. Hence, only the cubes in figures (3) and (4) can be formed.

1. Observe the dots on a dice (one to six dots) in the following figures. How many dots are contained on the face opposite to that containing four dots?



Answer: Option A Explanation:

We shall assume the dice in fig. (ii) to be rotated so that the 5 dots appear at the same position as in fig. (i) i.e. on RHS face (i.e. on face II as per activity 1) and 1 dot appears at the same position as in fig; (i) i.e. on Front face (i.e. on face I). Then, from the, two figures, 2 dots appear on the top face (i.e. on face V) and 4 dots appear on the Bottom face (i.e. on face VI).

Since, these two faces are opposite to each other, therefore, two dots are contained on the face opposite to that containing four dots.

2. Three different positions of a dice are shown below. How many dots lie opposite 2 dots?



Answer: Option C Explanation:

From figures (ii) and (iii), we conclude that 1, 6, 3 and 4 dots lie adjacent to 5 dots. Therefore, 2 dots must lie opposite 5 dots. Conversely, 5 dots must lie opposite 2 dots.



3. The six faces of a dice have been marked with alphabets A, B, C, D, E and F respectively. This dice is rolled down three times. The three positions are shown as:



Answer: Option C

Explanation:

From figures (ii) and (iii), we conclude that the alphabets C, D, B and F appear adjacent to the alphabet E. Therefore, the alphabet A appears opposite E. Conversely, E appears opposite A.

D

F

4. Three positions of a dice are given. Based on them find out which number is found opposite the number 2 in the given cube.



Explanation:

From figures (i) and (ii), we conclude that the numbers 1, 4, 3 and 5 lie adjacent to the number 6. Clearly, the number 2 lies opposite 6 and conversely 6 lies opposite 2.

5. A dice is thrown four times and its four different positions are shown below. Find the number on the face opposite the face showing 2.



Explanation:

From figures (i), (ii) and (iv) We conclude that 6, 4, 3 and 1 lie adjacent to



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2. Hence, 5 must lie opposite 2.

6. Two positions of a dice are shown. When 4 is at the bottom, what number will be on the top?

1 3	2	1 5 6	-			
(i)		(ii)				
А.	1				В.	2
С.	5				D.	6

Answer: Option A

Explanation:

From figures (i) and (ii), we conclude that 2, 3, 5 and 6 he adjacent to 1. Therefore, 4 lies opposite 1. Hence, when 4 is at the bottom, then 1 must be on the top.

7. A dice is rolled twice and the two positions are shown in the figure below. What is the number of dots at the bottom face when the dice is in position (i)?



Explanation:

From figures (i) and (ii) we conclude that 3, 4, 1 and 5 dots appear adjacent to 2 dots. Therefore, 6 dots must appear opposite 2 dots. Since, there are 2 dots on the top face when the dice is in position (i), therefore, the number of dots at the bottom face must be 6.

8. Below are depicted the three different positions of a dice. Find the number of dots on the face opposite to the face with one dot.



C. 4

D. 6

Answer: Option D Explanation:

From figures (i), (ii) and (iii), we conclude that 1, 3, 5 and 6 dots appear adjacent to the face with 2 dots. Therefore, 4 dots will appear opposite to 2 dots. Now, from figures (i) and (ii), we conclude that 2, 3 and 5 dots appear adjacent to 1 dot Therefore, either 4 or 6 dots will appear opposite to 1 dot. But since, 4 dots appear opposite to 2 dots it follows that 6 dots will appear opposite 1 dots.

9. Two positions of a parallelepiped are shown below. When the number 3 will be on the top side, then which number will be at the bottom?

(i)	?	(ii)				
А.	1			В.	4	
с.	5			D.	6	
A	0	ntion C				

Answer: Option C Explanation:

The number 2 is common to both the figures. We assume the parallelepiped in fig. (ii) to be rotated so that 2 appears at the same position as in fig. (i) i.e. on the RHS face and the numbers 6 and 3 move to the faces hidden behind the numbers 1 and 5 respectively [in fig. (i)]. Then, the combined figure will have 1 opposite 6 and 5 opposite 3. Thus, when 3 will be on the top, then 5 will appear at the bottom.

10. A dice is numbered from 1 to 6 in different ways.

If 1 is adjacent to 2, 3 and 5, then which of the following statements is necessarily true?

- **A.** 4 is adjacent to 6
- **B.** 2 is adjacent to 5
- **C.** 1 is adjacent to 6
- **D.** 1 is adjacent to 4

Answer: Option A Explanation:

If 1 is adjacent to 2, 3 and 5, then either 4 or 6 lies opposite to 1. So, the numbers 4 and 6 cannot lie opposite to each other. Hence, 4 necessarily lies adjacent to 6.



11. What will be the number at the bottom, if 5 is at the top; the two positions of the dice being as given below:

		6 2 3	-	-		
(i)		(ii)				
А.	1				В.	2
С.	3				D.	6

Answer: Option B Explanation:

From figures (i) and (ii), it is clear that 4, 1, 3 and 6 he adjacent to 2. Therefore, 5 must lie opposite 2. Thus, if 5 is at the top, then 2 must be at the bottom.

12. If the total number of dots on opposite faces of a cubical block is always 7, find the figure which is correct.



Answer: Option B Explanation:

Since the total number of dots on opposite faces is always 7, therefore, 1 dot appears opposite 6 dots, 2 dots appear opposite 5 dots and 3 dots appear opposite 4 dots.

13. Two positions of a block are given below. When 1 is at the top, which number will be at the bottom?



Explanation:

Number 2 is common to the two positions of the dice. We assume the dice in fig. (ii) to be rotated so that 2 remains on the top face (i.e. face V



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as per activity 1) and the numbers 3 and 6 move to the faces hidden behind 5 and 1 respectively [in fig. (i)]. Then, clearly, 5 lies opposite 3 and 6 lies opposite 1. Hence, when 1 is at the top, then 6 will be at the bottom.

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