

Undergraduate Common Entrance Examination for Design

# **UCEED 2023**

## **Paper Specific Instructions**

1. The total duration of the examination is 3 hours. The question paper contains two parts – Part A and Part B. The duration of Part A is **2 hours and 30 minutes**. Part B will begin after Part A ends. Part A is further divided into three sections, 1, 2 and 3. All sections are compulsory. Questions in each section are of different types. There are a total of **68 questions** carrying a total of 240 marks. Questions of Part A will appear on the computer. Answers to **Part A** have to be entered in the **computer**. **Part B** is also compulsory and contains **1 drawing question** of 60 marks.
2. Marking scheme of Part A is as follows:

Section	Type of questions	Number of questions	Marks for correct answer	Marks for wrong answer	Marks for each question not attempted	Total marks for the section
1	NAT	18	4	0	0	72
2	MSQ	18	Partial Marking	-1	0	72
3	MCQ	32	3	-0.71	0	96
Total		68				240

3. **Section 1 (72 Marks)** of Part A contains a total of 18 **Numerical Answer Type (NAT)** questions. For each question, the answer is a **real number with decimal digits upto two decimal places** that needs to be entered using the virtual keyboard on the monitor. No choices will be shown for these questions. There is **NO NEGATIVE** marking for this section. Questions from 1 to 18 belong to this section.
4. **Section 2 (72 Marks)** of Part A contains a total of 18 **Multiple Select Questions (MSQ)**. Each question may have **one or more than one correct choice(s)** out of the four given. The following is the marking scheme:

**Full Marks : + 4** If only (all) the correct option(s) is(are) chosen and NONE of the incorrect options is chosen.

**Partial Marks : + 3** If all the four options are correct but ONLY three options are chosen and NONE of the incorrect options is chosen.

**Partial Marks : + 2** If three or more options are correct but ONLY two options are chosen, both of which are correct and NONE of the incorrect options is chosen.

**Partial Marks : + 1** If two or more options are correct but ONLY one option is chosen and it is the correct option and NONE of the incorrect options is chosen.

**Zero Marks : 0** If NONE of the options is chosen (i.e., the question is unanswered);

**Negative Marks: -1** In all other cases.

Questions from 19 to 36 belong to this section.

5. **Section 3 (96 Marks)** of Part A contains a total of 32 **Multiple Choice Questions (MCQ)**. Each question has four choices out of which **ONLY ONE** is the correct answer. There is **NEGATIVE** marking for this section. Questions from 37 to 68 belong to this section.
6. **Part B (60 Marks)** contains one drawing question. There is **NO NEGATIVE** marking for this section. Answers to **Part B** have to be given in the **answer book** provided by the invigilator. Question 69 belongs to this section.
7. Calculators, charts, graph-sheets, mathematical tables, mobile phone, smart watches and/or other electronic gadgets are **NOT** allowed in the examination hall.
8. Scribble pad/blank sheets of paper will be provided for rough work.

## PART A

### Section 1: Numerical Answer Type (NAT) questions

**Section 1 (72 Marks)** of Part A contains a total of 18 **Numerical Answer Type (NAT)** questions. For each question, the answer is a real number that needs to be entered using the virtual keyboard on the monitor. No choices will be shown for these questions. There is **NO NEGATIVE** marking for this section. Each correct answer will be awarded 4 marks. Questions that are not attempted or answered incorrectly will be given zero mark. Questions from 1 to 18 belong to this section.

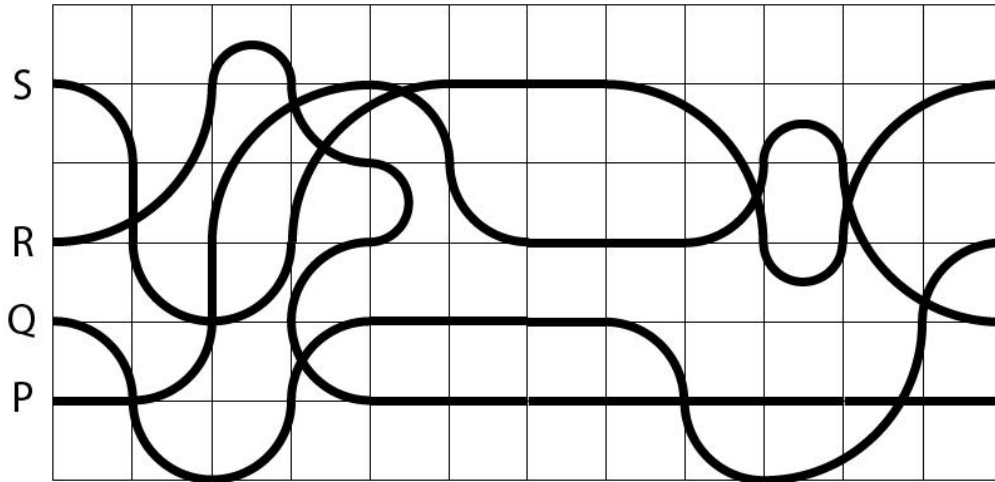
**Q.01** How many times does the shape sequence (shown on the top) appear in the grid below? The sequence may appear top-to-bottom, bottom-to-top, left-to-right, right-to-left or at an angle.



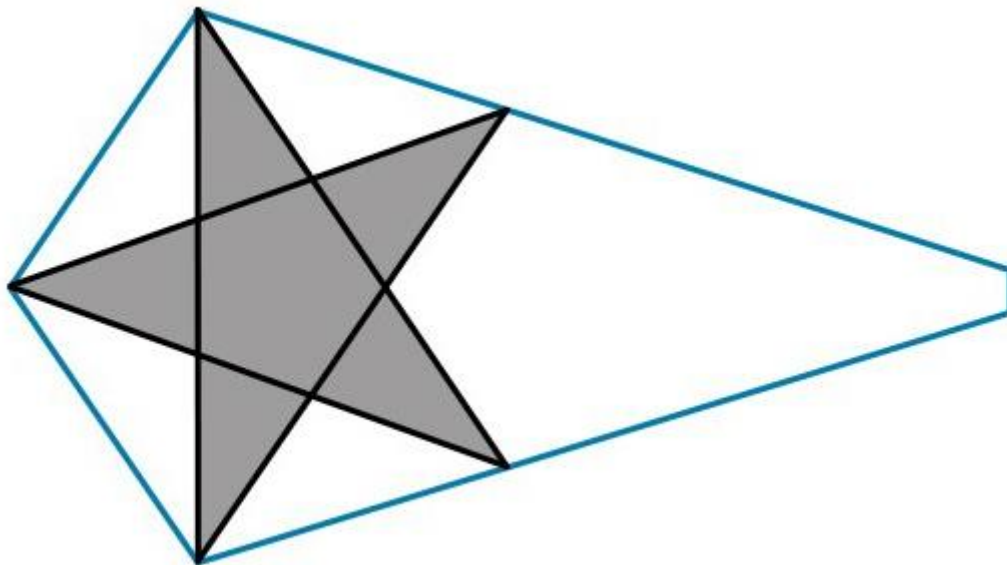
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▶	●	▲	■	⬡	●
★	⬡	▶	★	▶	★
⬡	●	■	▲	▶	⬡
■	■	▶	★	●	●
▶	▲	★	■	▶	★
●	★	▲	■	●	⬡

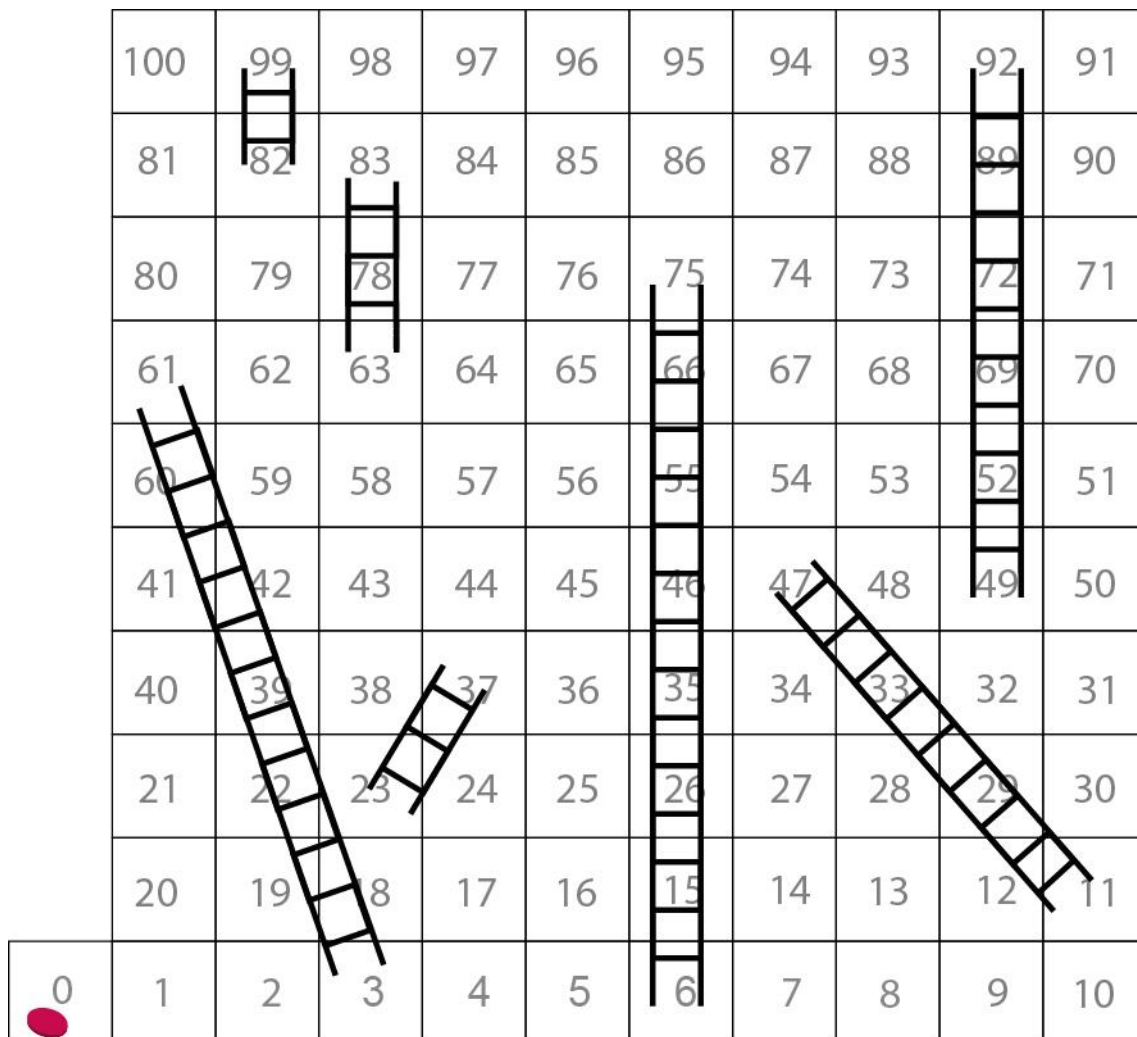
**Q.02** The bold lines correspond to four different paths P, Q, R and S. What is the length of the longest path? The length of each side of the square grids is 7 units. Use  $\frac{22}{7}$  as the value for  $\pi$ .



**Q.03** What is the maximum number of stars that can be packed inside the blue colour boundary including the one that is shown in the image below? The stars can be scaled but should not overlap. At least 4 points of every star should touch the blue colour boundary.



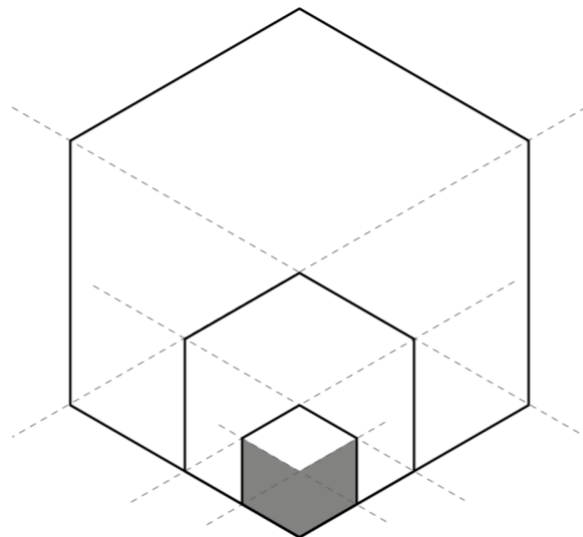
**Q.04** A dice throw can result in the numbers 2,3,5 or 6. Every 4th throw will result in 3.  
What is the minimum number of times the dice has to be thrown for the pawn to move from zero to reach exactly at 100?



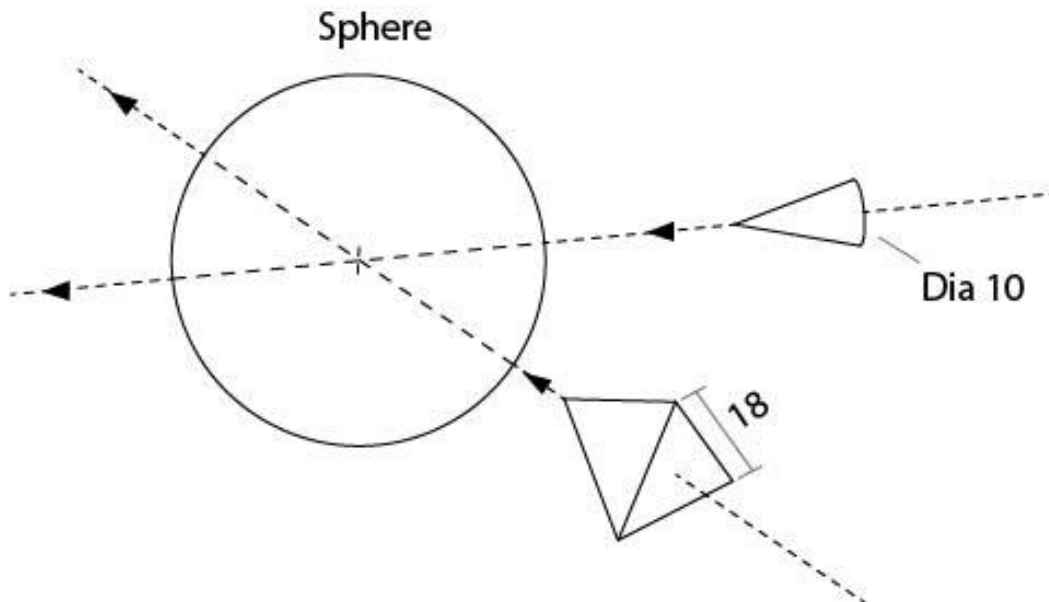
**Q.05** Count the number of human figures in the picture.



**Q.06** In the figure given below, the area of the largest regular hexagon is 720 units. What is the area of the shaded portion?



**Q.07** A tetrahedron of side 18 units and a cone having base diameter of 10 units are cutting through a sphere as shown. Count the total number of surfaces in the resultant sphere.



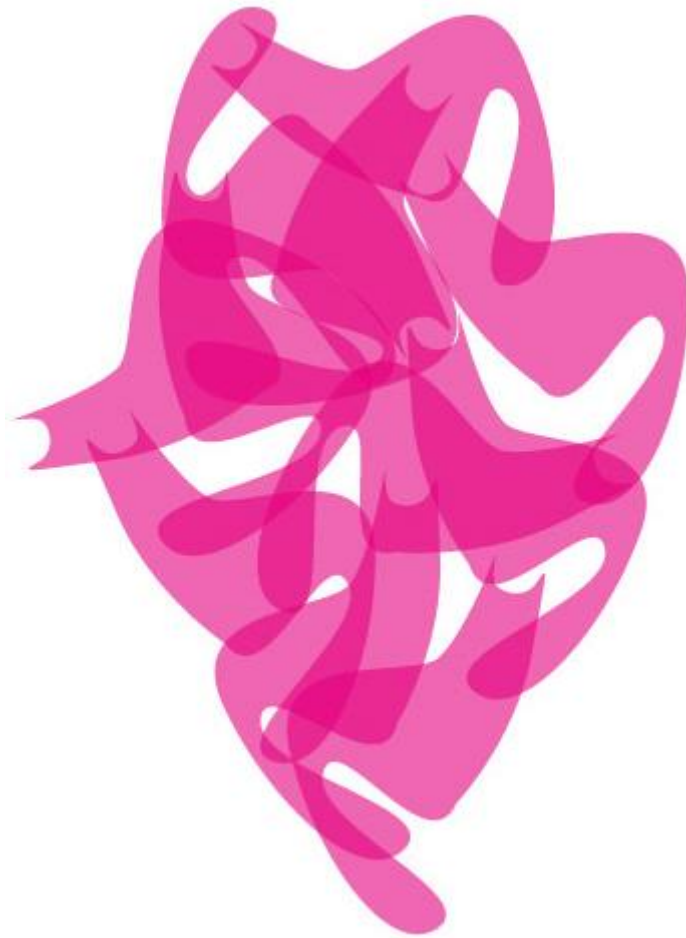
**Q.08** Tim cycled from his house to his friend John's house and then on to his (Tim's) school without stopping. The average speed for his entire journey was 26 km/hr. The distance from John's house to Tim's school is 0.3 times the distance from Tim's house to John's house. Tim's speed from John's house to Tim's school was twice that of Tim's speed from Tim's house to John's house. What was Tim's average speed from John's house to Tim's school in km/hr?

**Q.09** Identify the total number of differences in the images shown below.



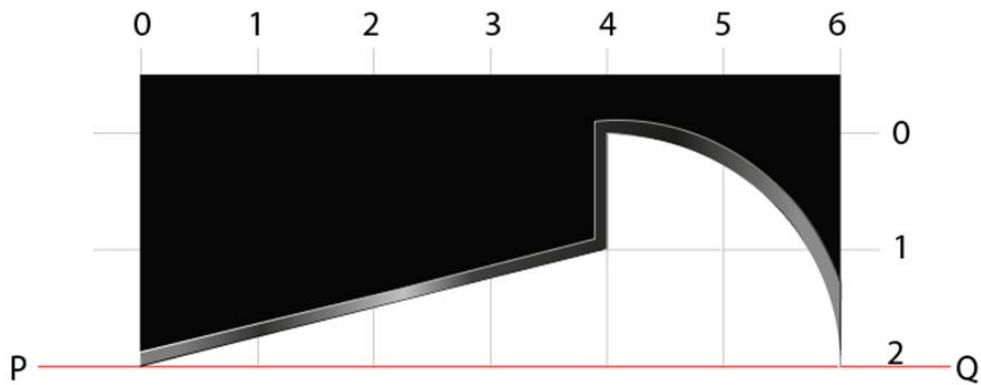


**Q.10** Count the number of cats in the given image.

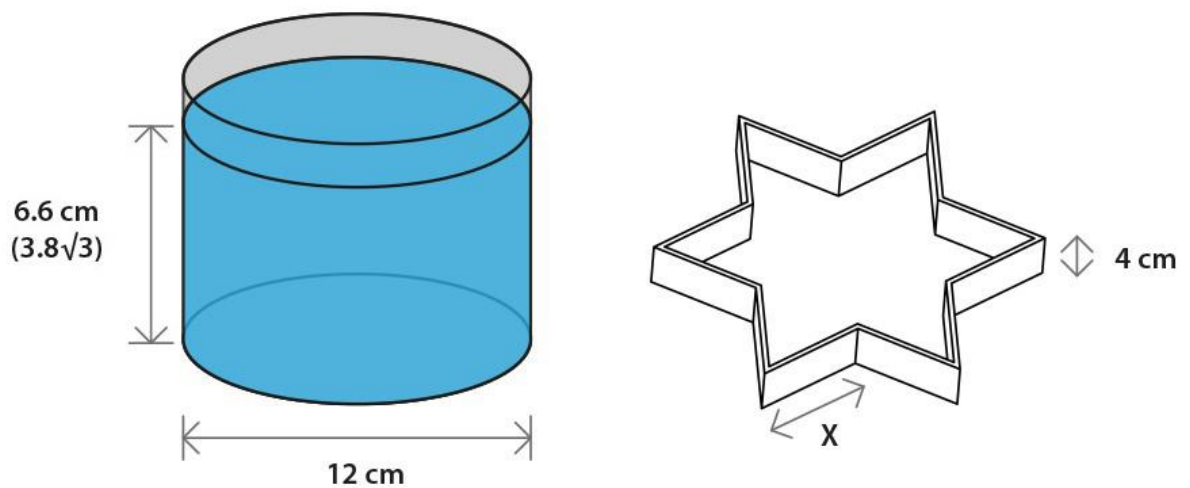


**Q.11** Two trains of unequal length have speeds of 60 and 50 km/hr. When they travel in opposite directions in straight line tracks, they take 9 seconds to completely cross each other. When they travel in the same direction, a person in the faster train sees the slower train for 18 seconds. For how much time (in seconds) would a person in the slower train see the faster train when the trains travel in the same direction?

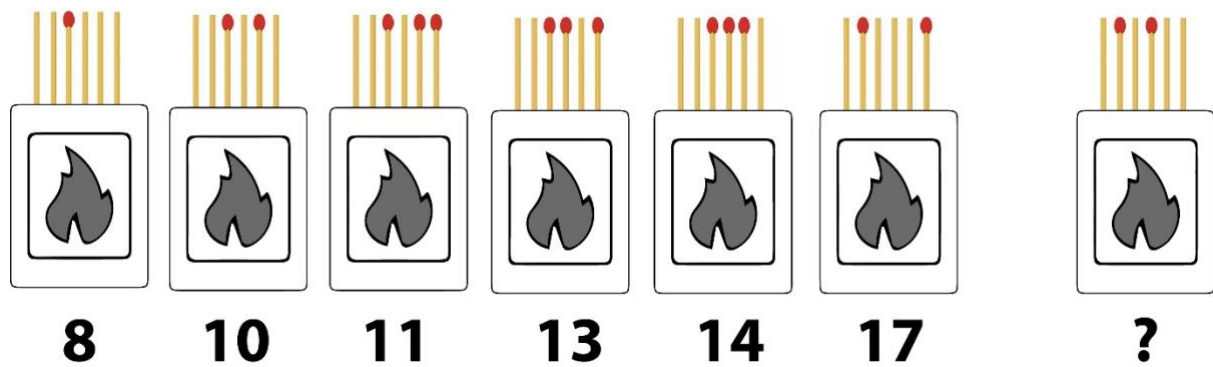
**Q.12** The image shows the profile of the blade which is designed to turn a wooden block, rotating about the axis PQ. Calculate the volume of the turned wooden block between P and Q. Consider the value of  $\pi$  to be  $\frac{22}{7}$ .



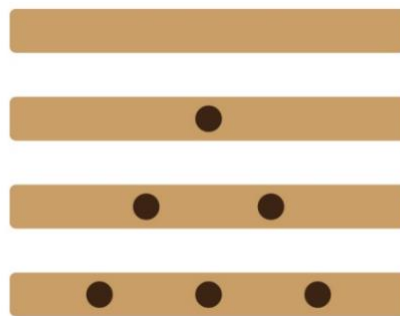
**Q.13** A blue colour liquid is used completely to make a star shaped jelly using the mould shown on the right. What is the value of 'X' in cm? Ignore the wall thickness of the mould and consider the value of  $\pi$  to be  $\frac{22}{7}$ .



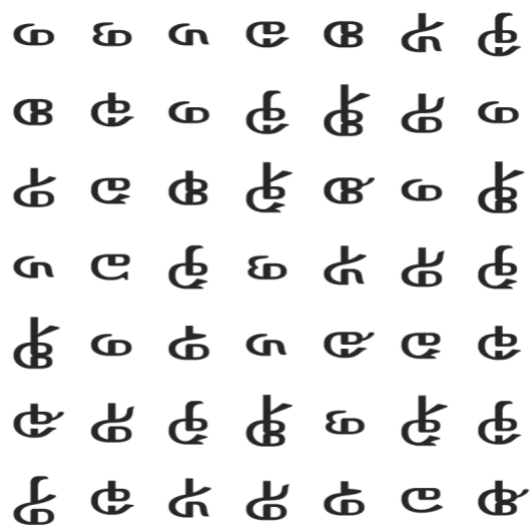
**Q.14**



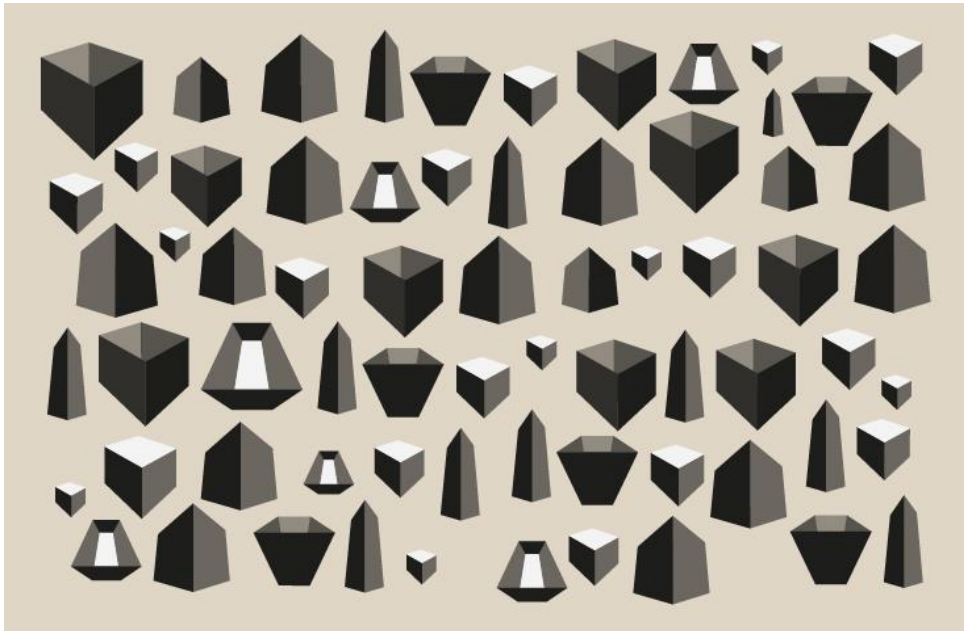
**Q.15** Shown below are four sides of a rectangular dice. If 3 such dice are thrown together, what is the probability of getting a total sum of 4? Consider the value of the blank side to be zero.



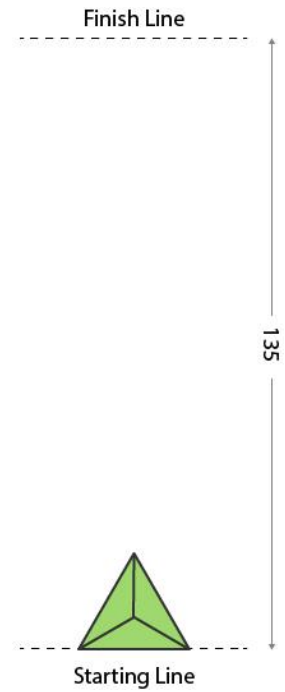
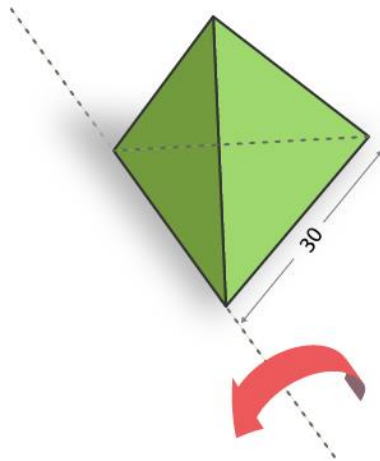
**Q.16** How many distinct types of characters appear in the figure given below?



**Q.17** Objects made out of cardboard are shown in the image below. Count the number of objects shown as open containers in this image.



**Q.18** A triangular pyramid with equal sides can be flipped on its edges without slipping or sliding as shown on the left. What is the minimum number of flips needed for the pyramid to reach the finishing line if the starting position is as shown on the right?



## Section 2: Multiple Select Questions (MSQ)

**Section 2 (72 Marks)** of Part A contains a total of 18 **Multiple Select Questions (MSQ)**. Each question may have **one or more than one correct choice(s)** out of the four given. The following is the marking scheme:

**Full Marks : + 4** *If only (all) the correct option(s) is(are) chosen and NONE of the incorrect options is chosen*

**Partial Marks : + 3** *If all the four options are correct but ONLY three options are chosen and NONE of the incorrect options is chosen*

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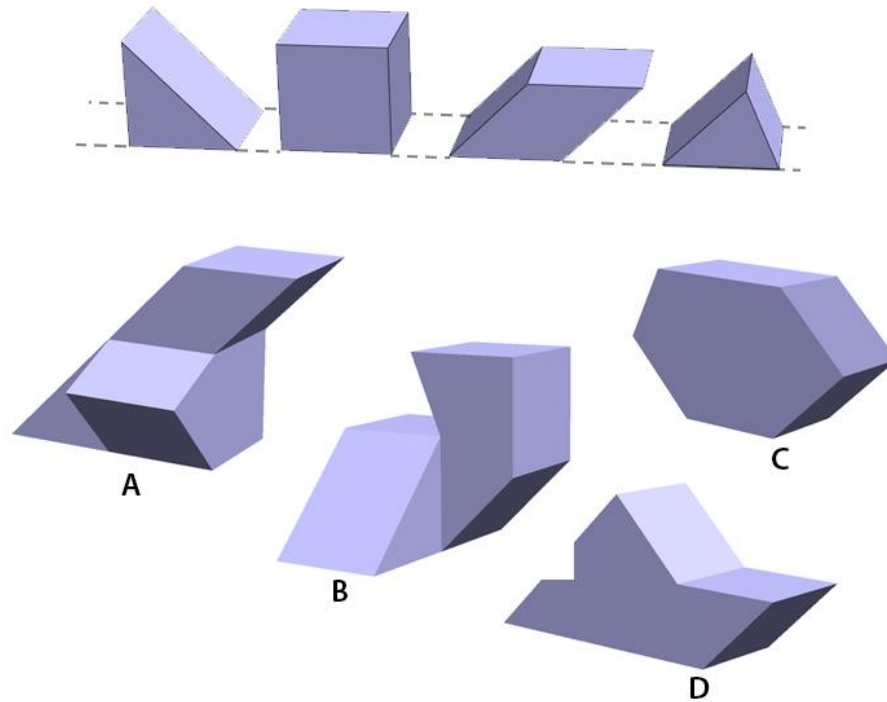
**Partial Marks : + 1** *If two or more options are correct but ONLY one option is chosen and it is the correct option and NONE of the incorrect options is chosen.*

**Zero Marks : 0** *If NONE of the options is chosen (i.e., the question is unanswered);*


**Negative Marks: -1** *In all other cases.*

*Questions from 19 to 36 belong to this section.*


**Q.19** Shown in the top row are 4 pieces of building blocks. Which of the option(s) is/are made using all four pieces?




**Q.20** A printer wishes to print four colours, Crimson, Pink, Brown, and Indigo, using CMYK [Cyan, Magenta, Yellow and Key (black)] inks. The printer uses the CMYK combinations shown below (in % of each ink) to produce the colours on the right. Which combination(s) will result in the correct colour(s)?

C = 05 %	}	 Crimson
M = 90 %		
Y = 70 %		
K = 05 %		


**A**

C = 05 %	}	 Pink
M = 15 %		
Y = 70 %		
K = 00 %		

**B**

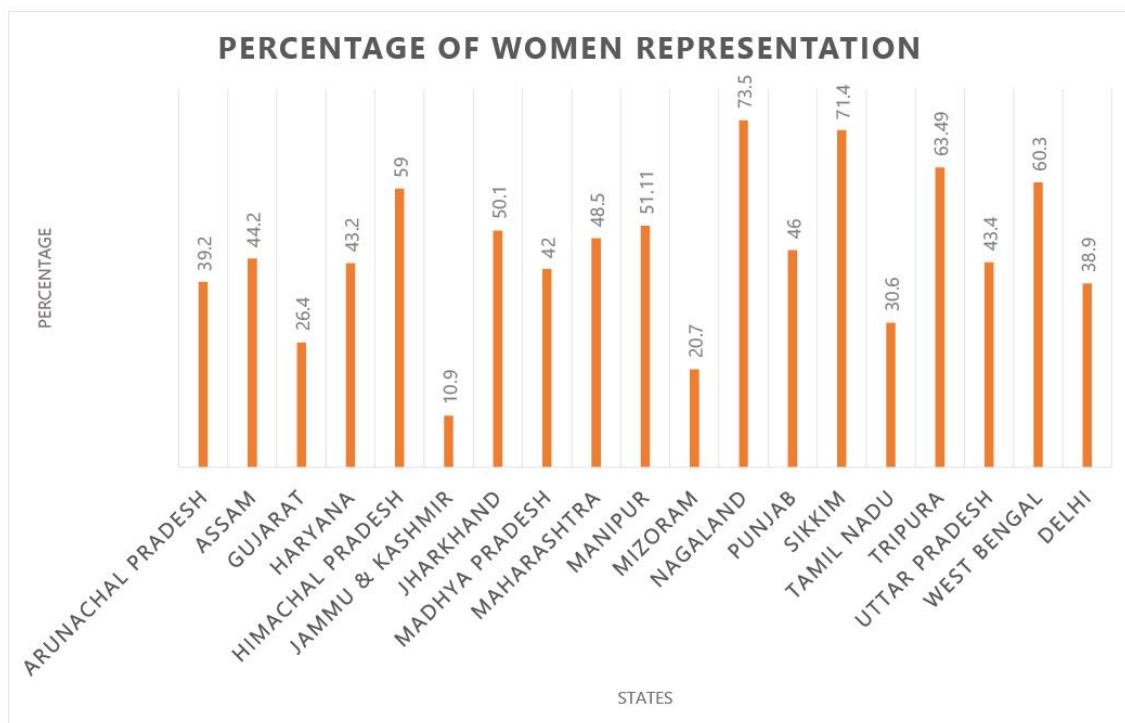
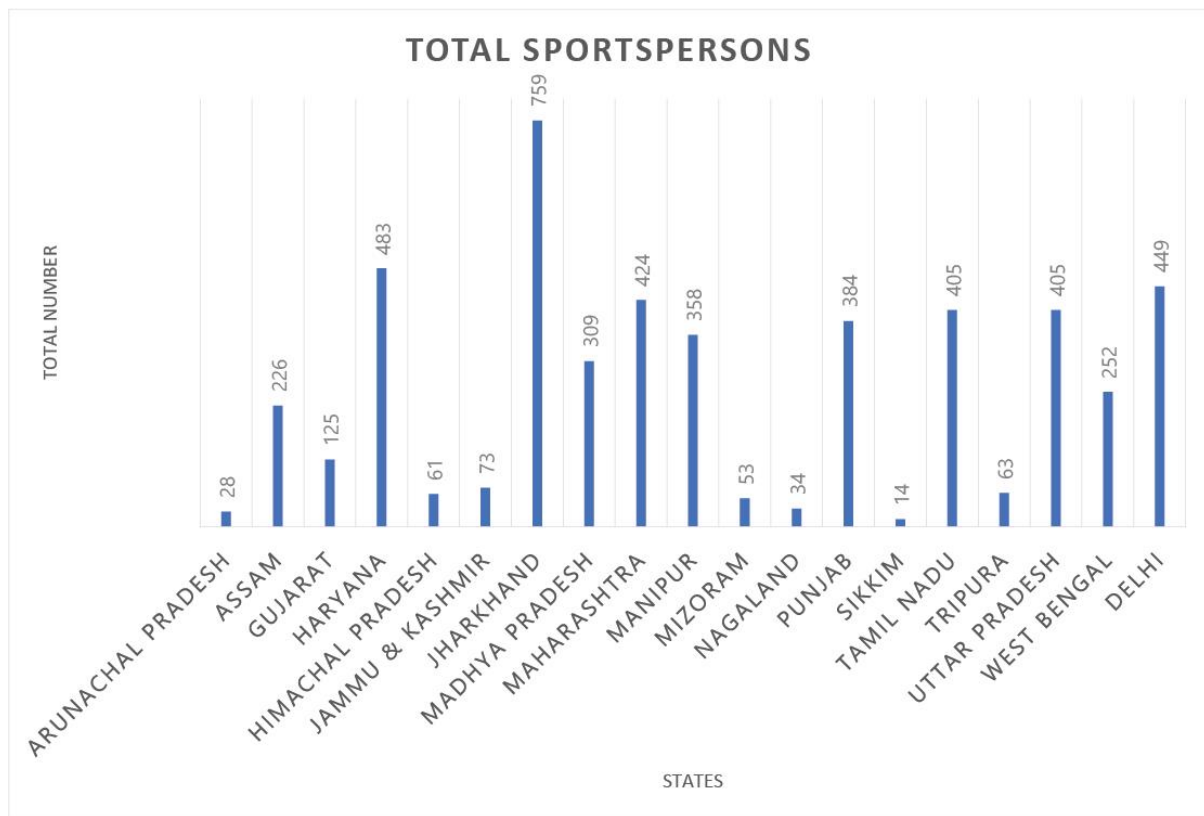
C = 50 %	}	 Brown
M = 50 %		
Y = 100 %		
K = 05 %		

**C**

C = 50 %	}	 Indigo
M = 90 %		
Y = 00 %		
K = 05 %		

**D**

Q.21

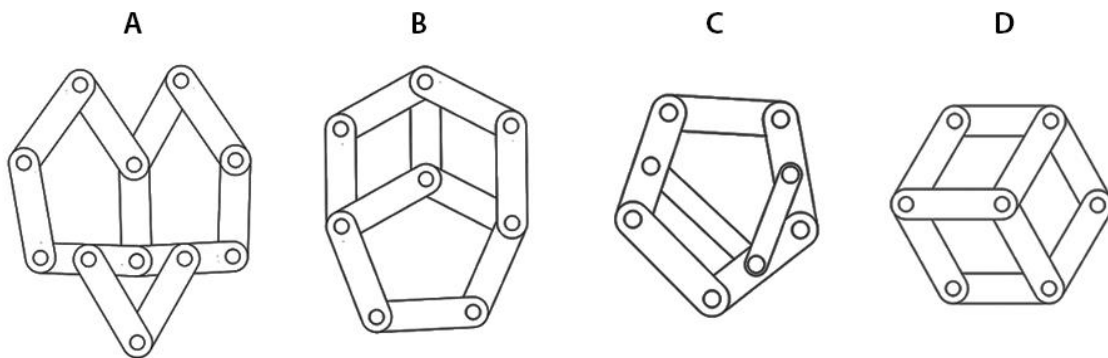




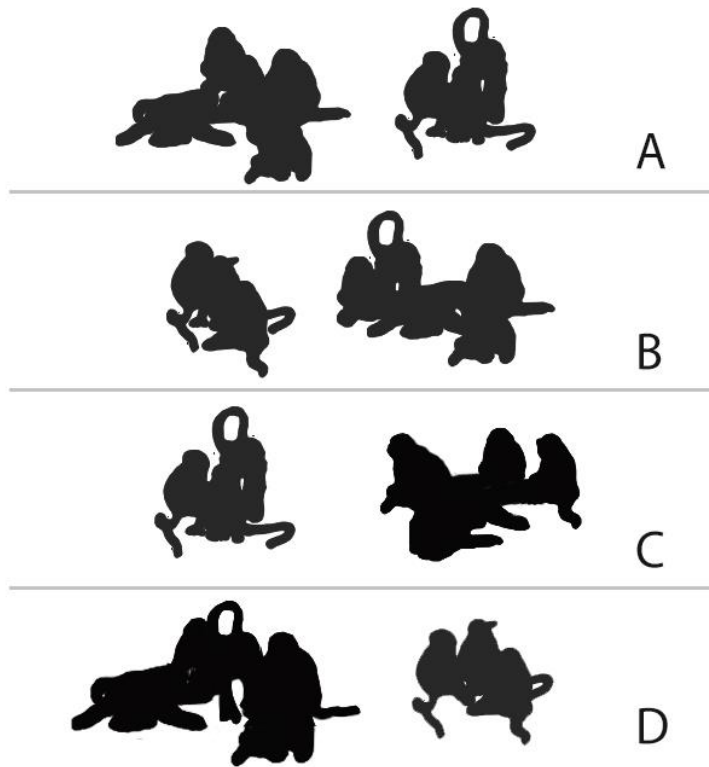
Which of the statement(s) is/are true?

- A. Jharkhand has the highest number of sportspersons but its percentage of women representation is not the highest.
- B. Of all the North-Eastern states, Nagaland produces the highest number of sportspersons.
- C. Jammu & Kashmir has low number of sportspersons but high women's representation.
- D. Even though Tamil Nadu and Uttar Pradesh have the same number of sportspersons, Uttar Pradesh fares higher in women's representation as compared to Tamil Nadu.

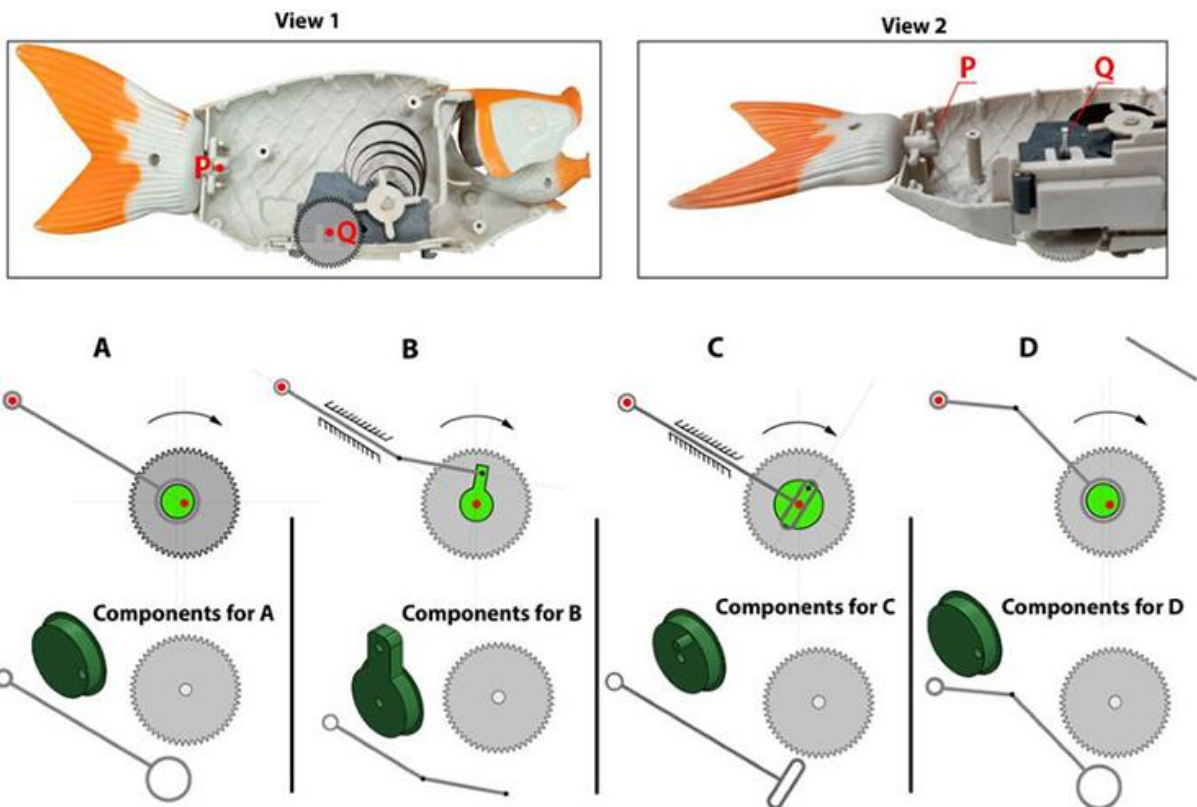
**Q.22** The figure below shows four mechanisms made using links and hinges. If circles represent hinges, which of the option(s) will allow relative motions between the links?



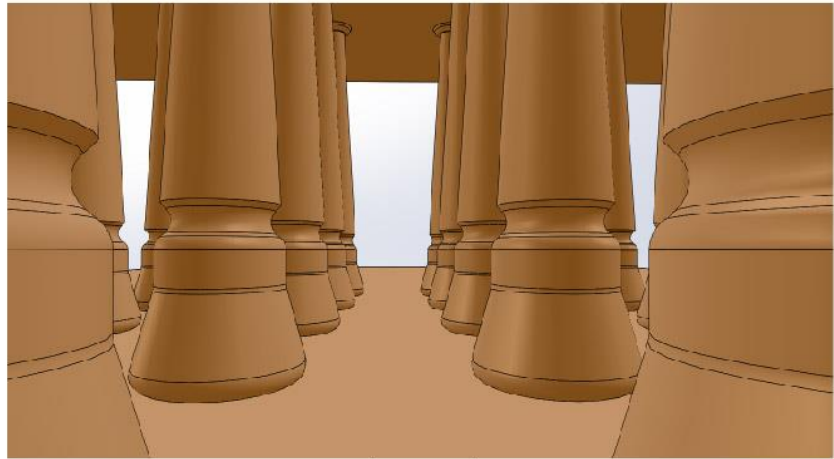
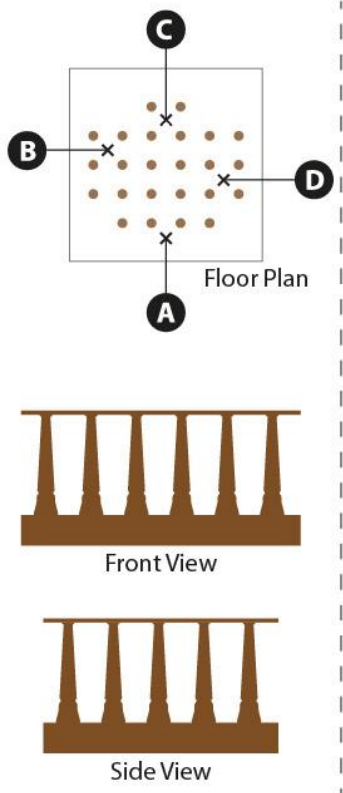
**Q.23** Shown on the left is a sheet of stickers. Identify the option(s) in which monkeys of the same species are sitting together.



**Q.24** Different views of the cross section of a fish toy are shown here. The points P and Q are connected in such way that the fish tail waves. The grey colour gear and the green colour part are joined together. The rod is free to move depending on how it is connected to the green part. Which of the option(s) will work to wave the tail?

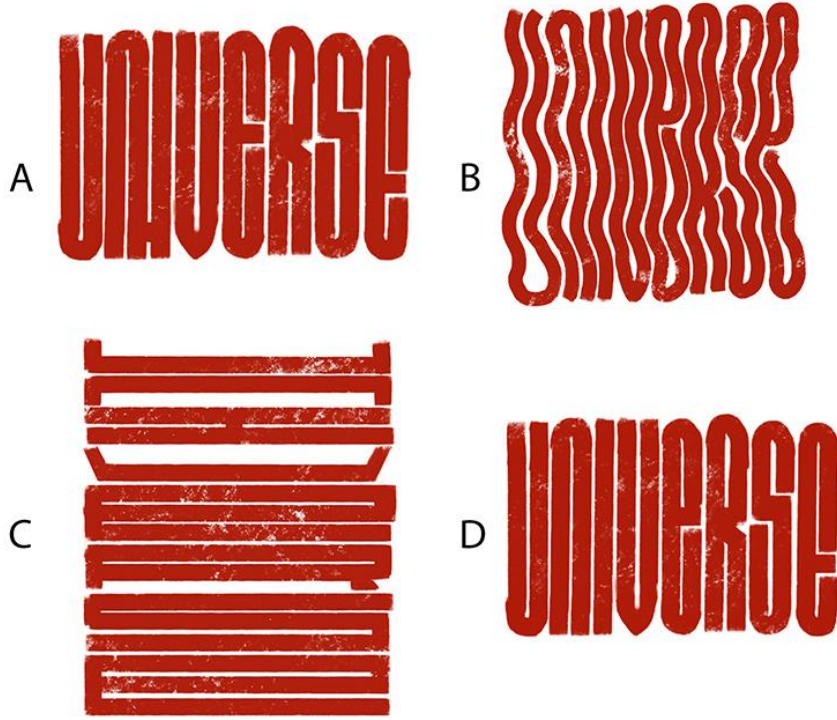


**Q.25** A tourist is shooting photographs of an ancient building from four locations A, B, C and D marked by x. The tourist is using only one camera without changing its magnification. Identify the location(s) in the floor plan which will result in the given photograph.



Photograph

**Q.26** The options show four ways of attempting to write the word "universe" in a mix of lower-case and upper-case letters. Which of the option(s) is/are correctly read as "universe"?



**Q.27** Which of the option(s) is/are from the same font family (i.e. weight and/or width variations) of the words given below?

मुद्राक्षर अभिकल्प

फेड वात धागा अकल

A B C D

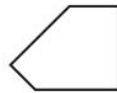
**Q.28** Which of the pieces could be used four times individually to form a square? The pieces can be rotated and flipped but should not be overlapped.



A



B

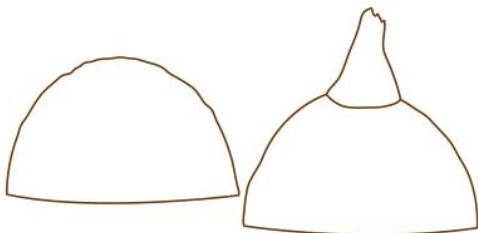


C

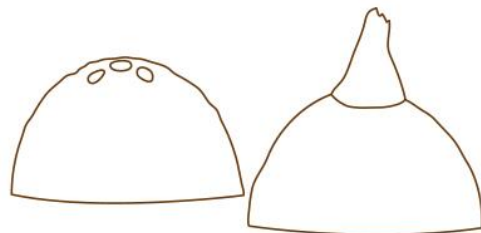


D

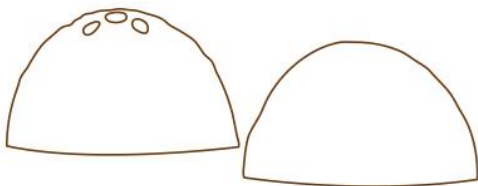
**Q.29** Shown below is a coconut broken into two pieces. Identify the correct representation(s) of the coconut.



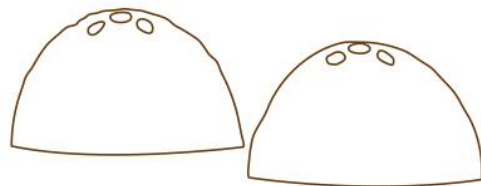
A



B

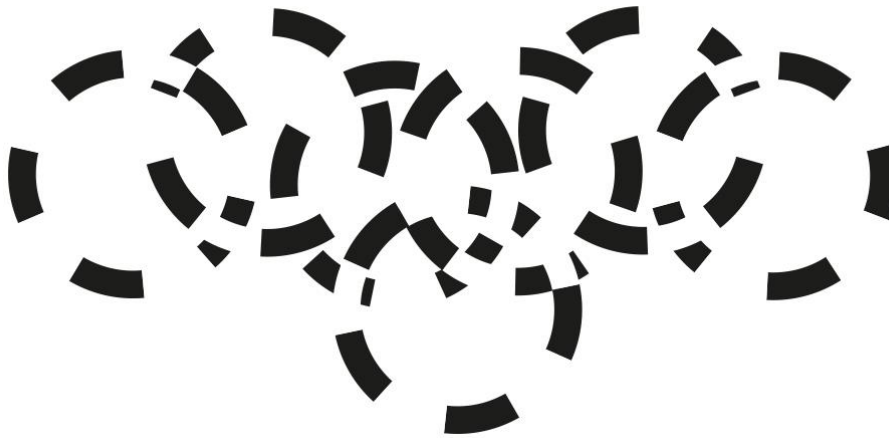


C



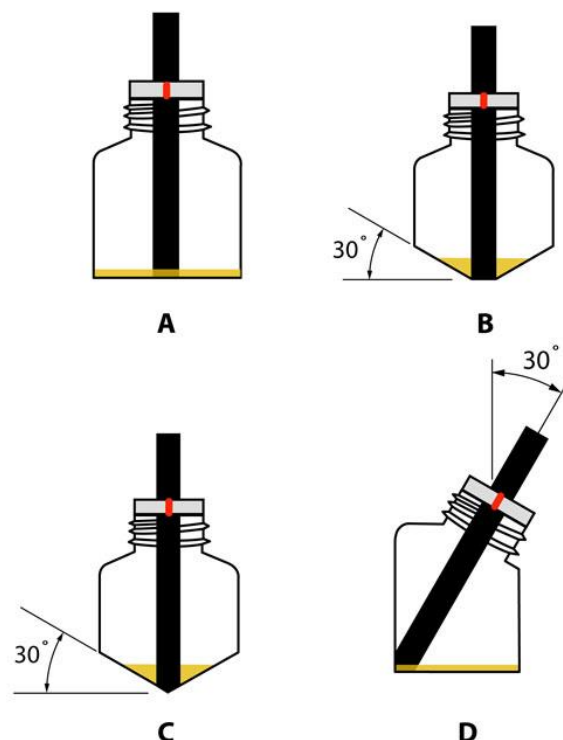
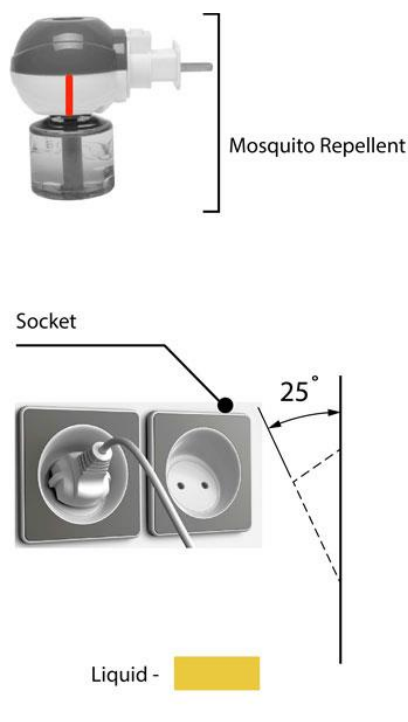
D

**Q.30** Shown below is an image of solid rings of black and white patterns. A ring going inside another is called a link. Which of the statement(s) is/are TRUE.



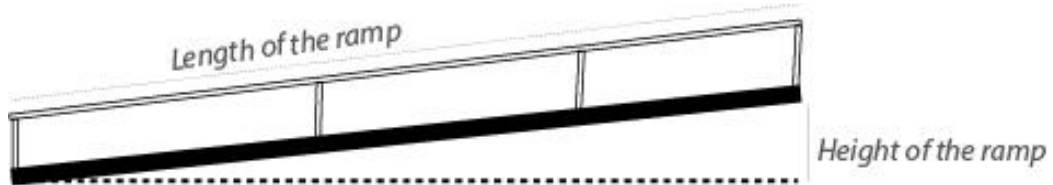
- A. All rings are linked to form one continuous chain.
- B. One ring does not have any link.
- C. One ring has three links.
- D. Two rings have only one link.

**Q.31** The options show different configurations of refill bottles of mosquito repellent, for an atypical socket shown on the left. After fitting, the red mark on the refill bottle must align with the red mark on the machine. Which of the option(s) will allow all of the liquid to be consumed?

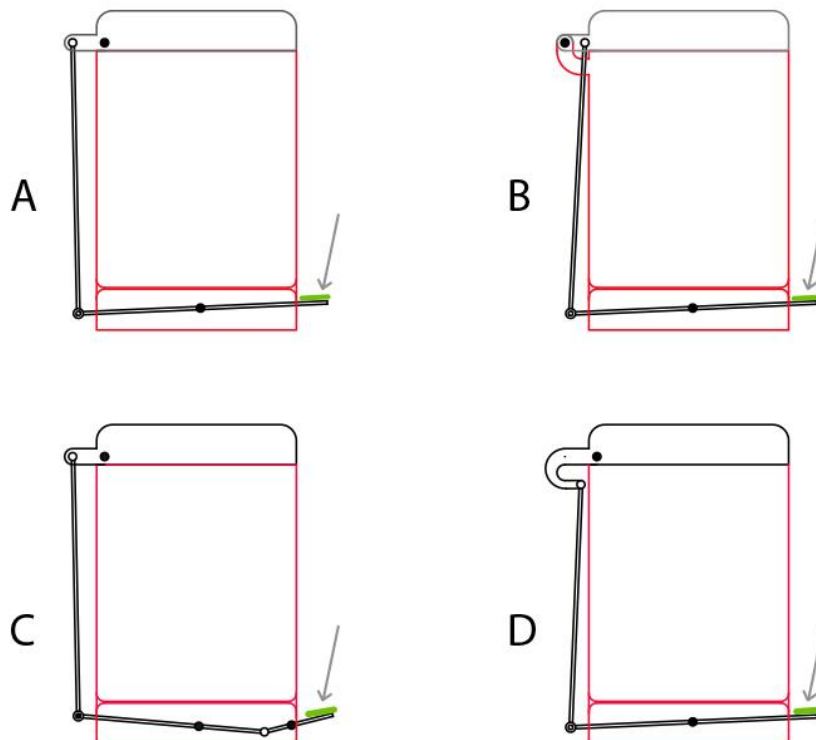


**Q.32** With reference to the image below, which of the statement(s) is/are false?

- A. Ramps are good solution for standard wheel chair users to access any building with entry above ground level.
- B. Height along with the length of the ramp will determine if standard wheel chair users can use it without assistance.
- C. People on standard wheel chair will need assistance to go up and down shorter length ramps irrespective of its height.
- D. A shorter length of ramp is convenient for standard wheel chair users without assistance, if the height of the ramp is high.

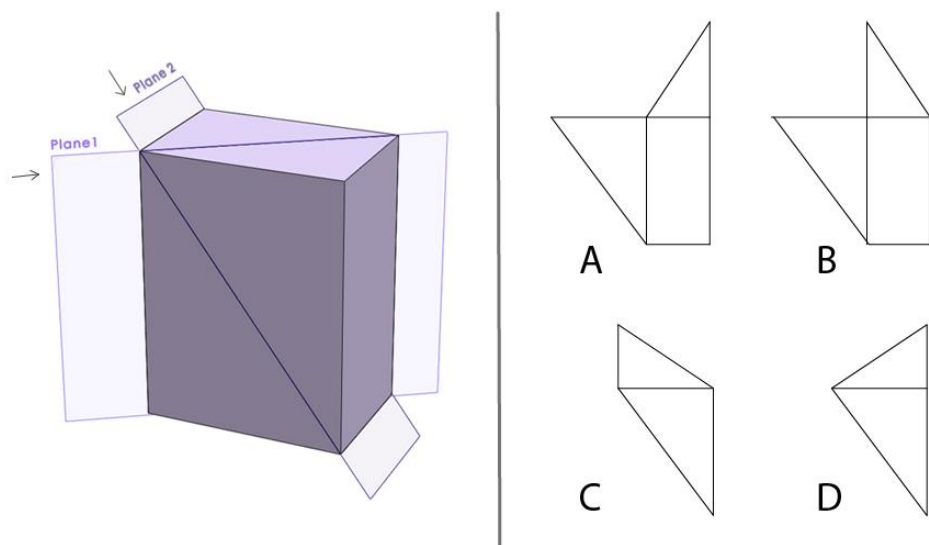


**Q.33** In which of the option(s) dust-bin lids will open?

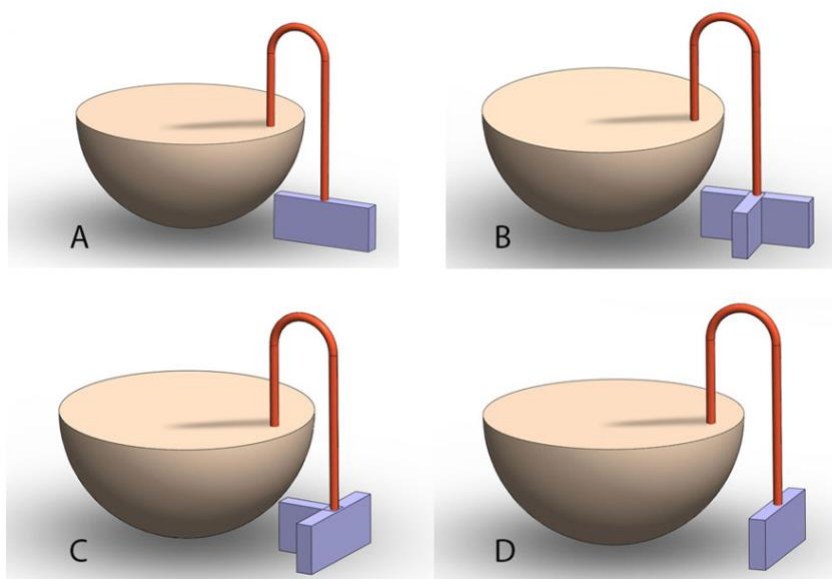


**Q.34** On 16<sup>th</sup> July 2022, Parvathy bought 4 new pairs of socks A, B, C and D to train herself for the Marathon race on Gandhi Jayanti. She started her training next day wearing the new socks. She trained every day, including the day of the marathon, wearing the socks (one pair every day) in the following sequence: C, A, B and D. Unfortunately, she could not train from 3<sup>rd</sup> to 22<sup>nd</sup> September 2022 as she was unwell. She resumed her training on 23<sup>rd</sup> wearing pair 'A' socks and continued with the same sequence till the event day. Identify the pair of socks that Parvathy wore the maximum during her entire training period.

**Q.35** The rectilinear hollow box shown on the left is cut along plane 1 and plane 2. Which of the option(s) show(s) correct unfolded pieces?



**Q.36** Shown below are tables of a new design. Which table(s) will not tilt, if given a small perturbation in any direction?



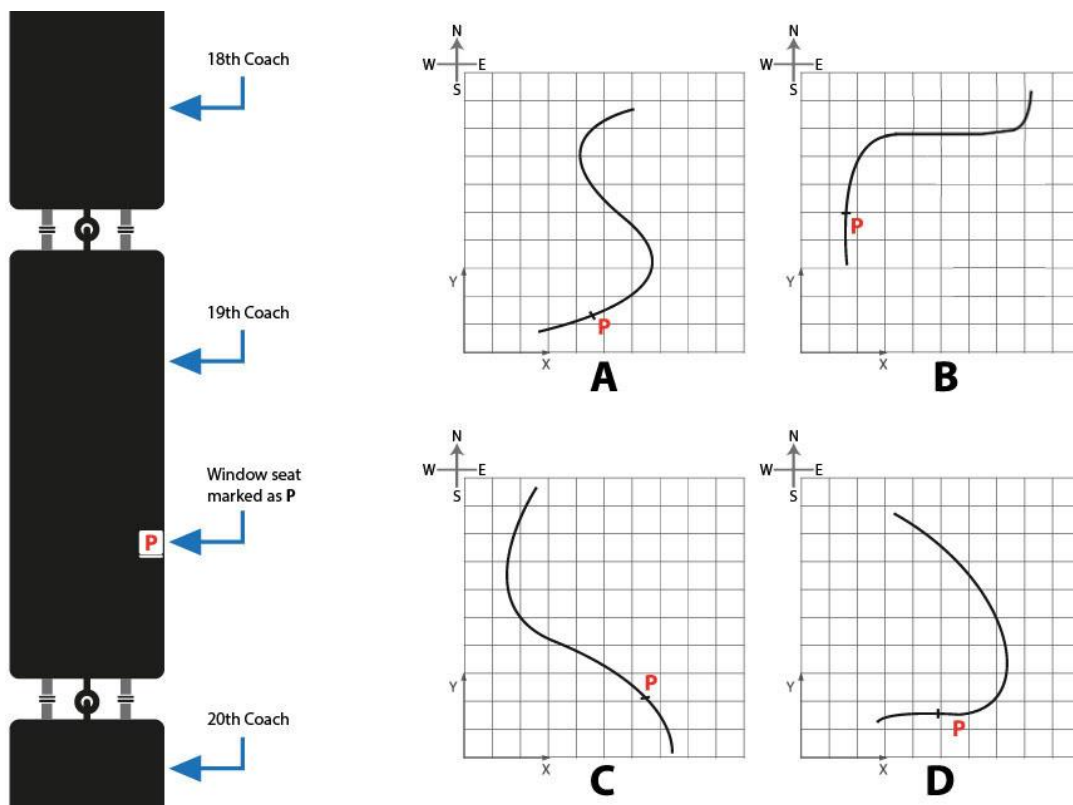


## Section 3:

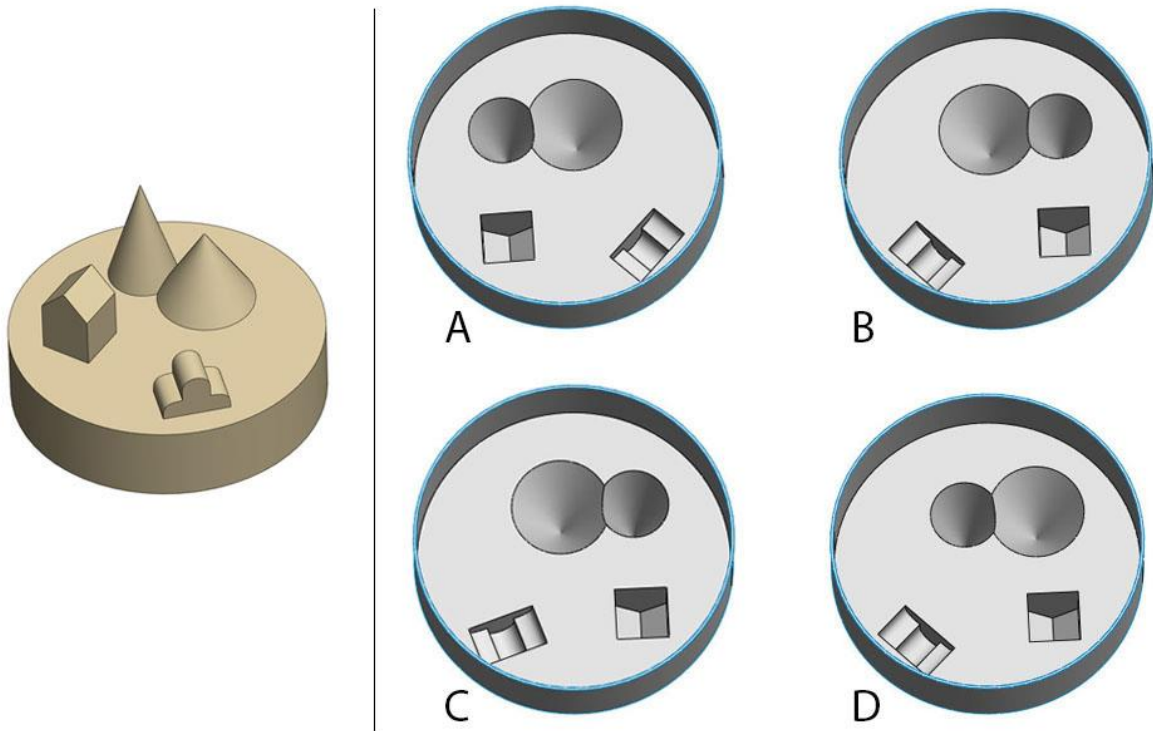
### Multiple Choice Questions (MCQ)

**Section 3 (96 Marks)** of Part A contains a total of 32 **Multiple Choice Questions (MCQ)**. Each question has four choices out of which **ONLY ONE** is the correct answer. There is **NEGATIVE** marking for this section. Each correct answer will be awarded 3 marks and each wrong answer will receive  $-0.71$  (minus point seven one) mark. Questions not attempted will be given zero mark. Questions from 37 to 68 belong to this section.

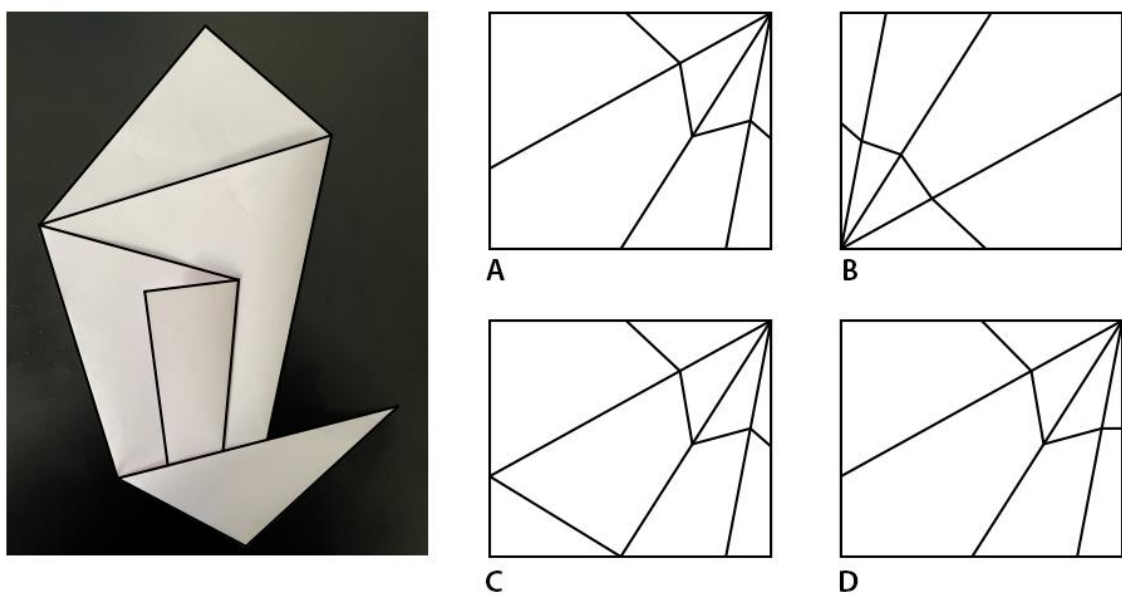
**Q.37** Imagine that you are travelling in a passenger train, with 22 coaches, depicted by curved black lines in the options. You are sitting on a window seat in the 19<sup>th</sup> coach (seat position marked as P). At a given instant of time when the train is heading northwards, select the option which will allow you to see the engine at the front clearly through the window of your seat.



**Q.38** Which of the moulds shown on the right can be used to make the cake shown on the left?

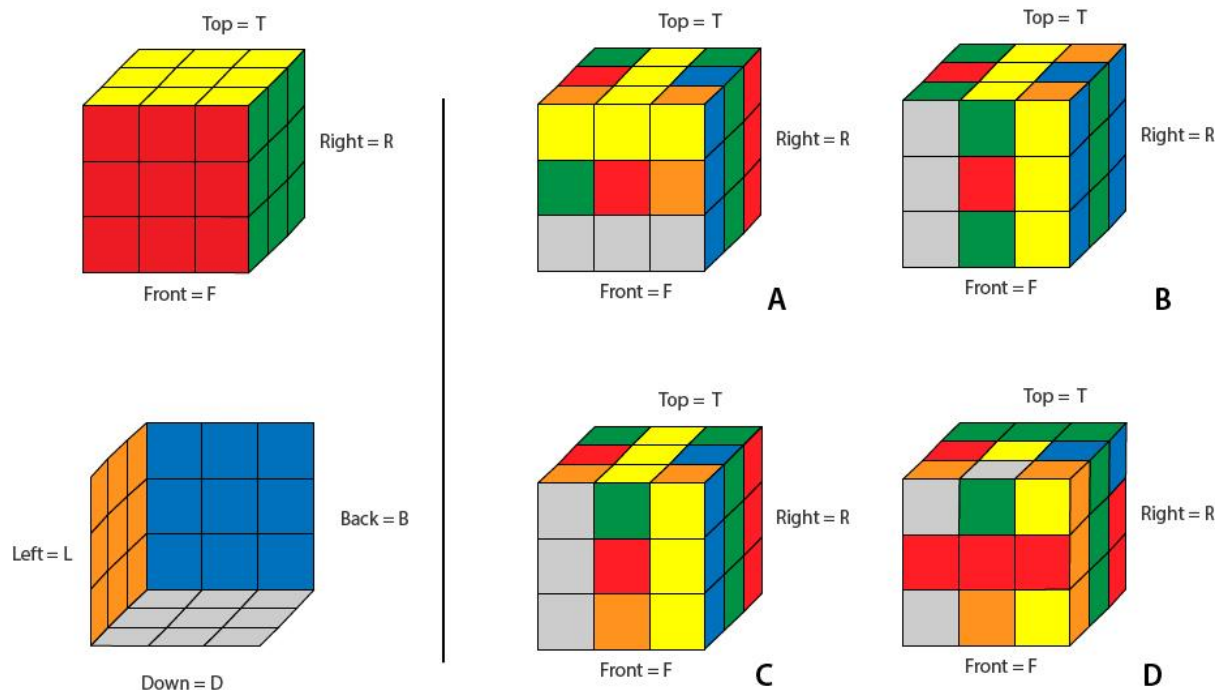


**Q.39** Which of the options shown on the right, when folded at the lines, will resemble the paper shown on the left?

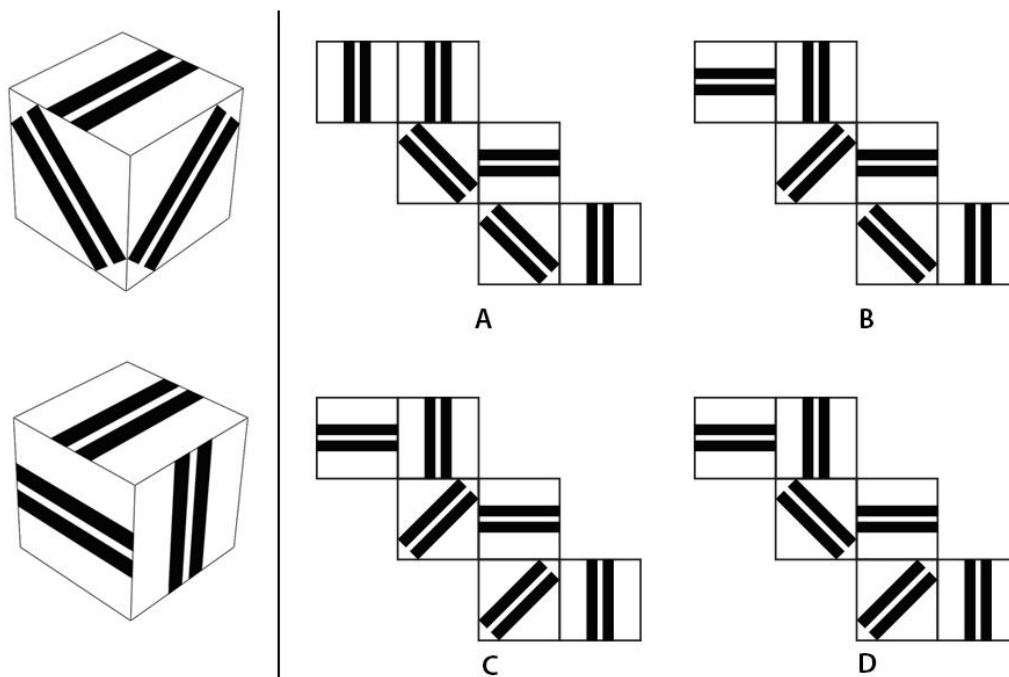


**Q.40** The faces of a solved Rubik's Cube are shown in the figure. A 90 degree clock wise turn of a face T is denoted as 'T+' and 90 degree anticlockwise rotation is denoted as 'T-'. What is the result of the operation T+, D+, R-, L-?

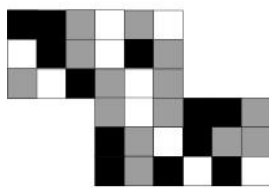
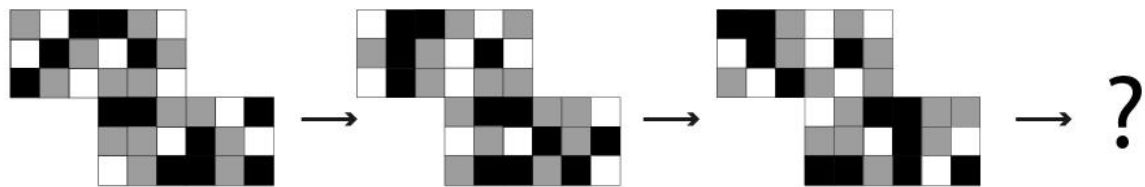
All operations are done looking directly at the face.



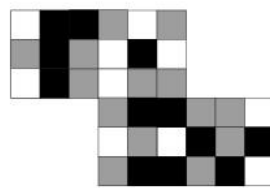
**Q.41** Shown on the left are all the 6 faces of a cube. Which option can be folded into this cube?



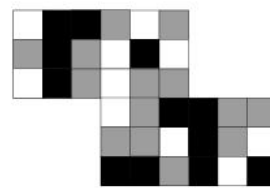
**Q.42**



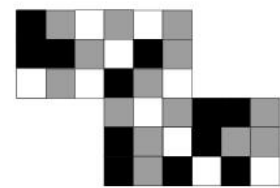
A



B



C



D

**Q.43** The white part in the shoe sole shown left represents the embossed / raised area. Find out the right footprint of the shoe from the given options.



A



B

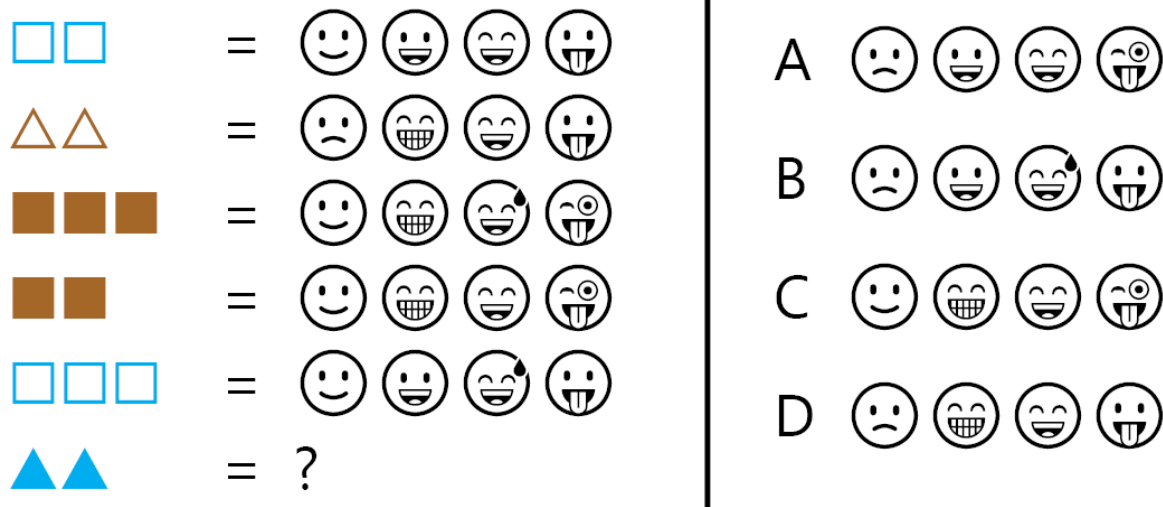


C



D

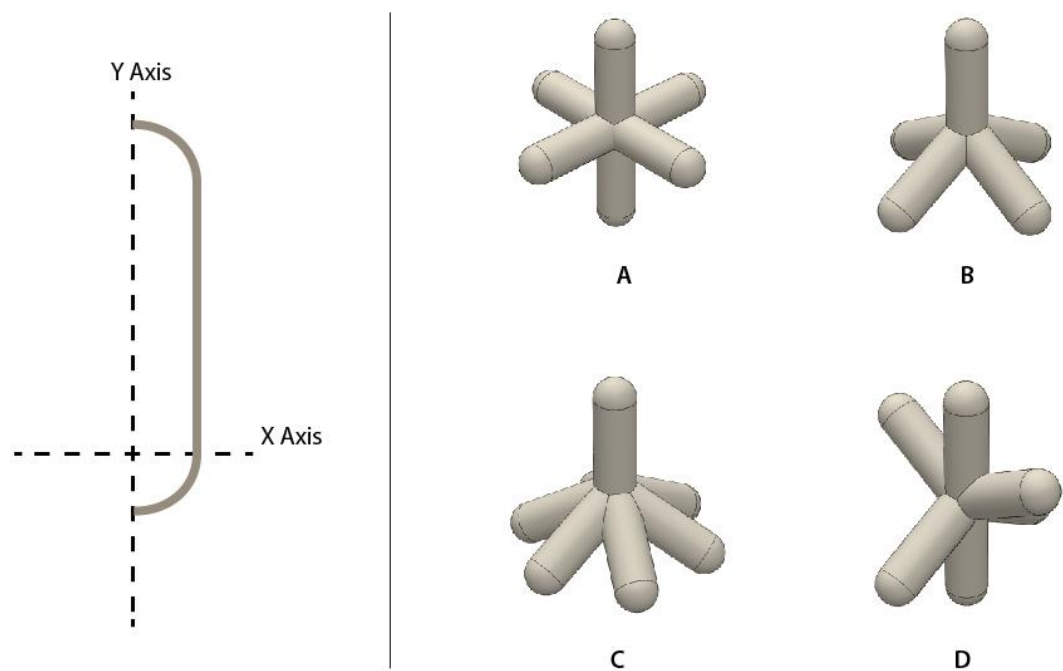
**Q.44**



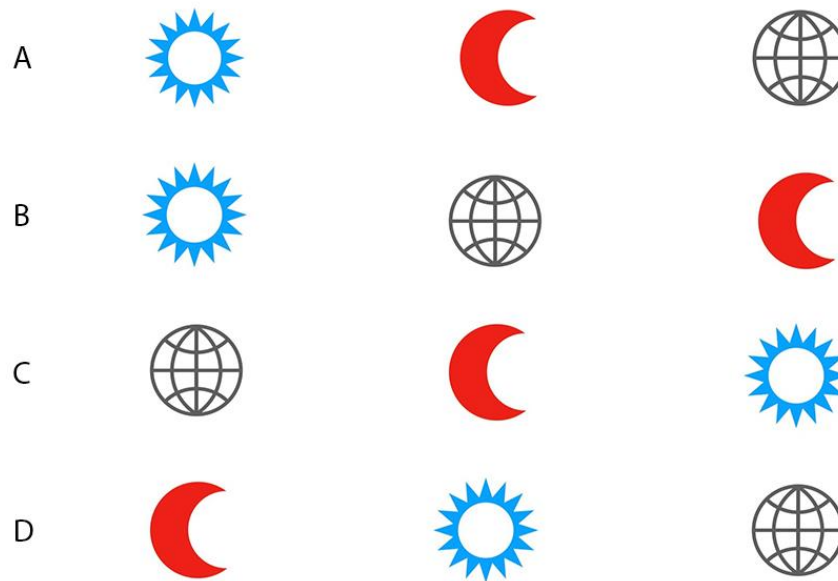
**Q.45** The following operations are done on the curve shown in the figure.

1. The curve is revolved 360 degrees around the Y axis.
2. The resulting form is then cloned twice around the X axis at 120 degrees to each other.
3. The resulting form is then cloned once about the Y axis at 90 degrees.

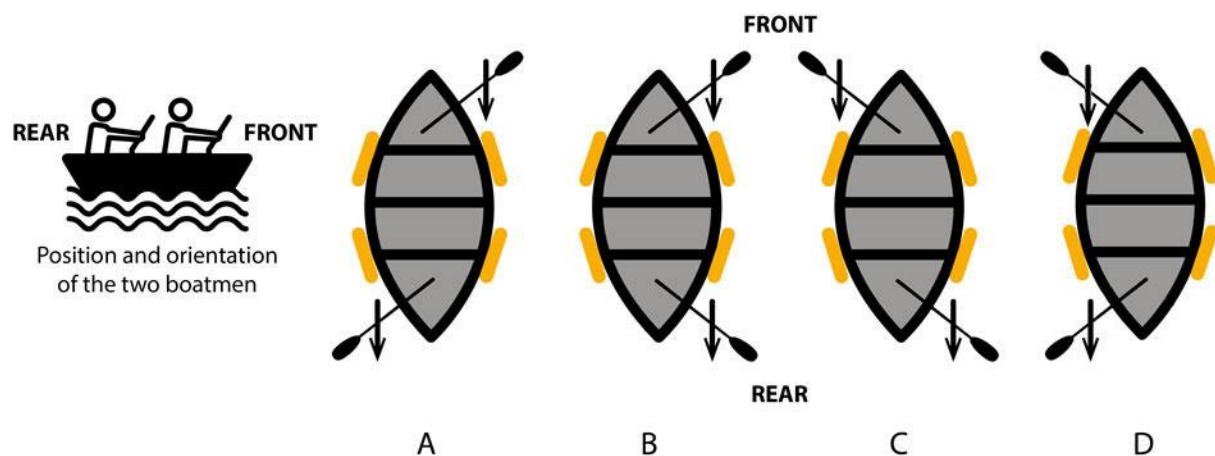
What is the resulting 3D form?



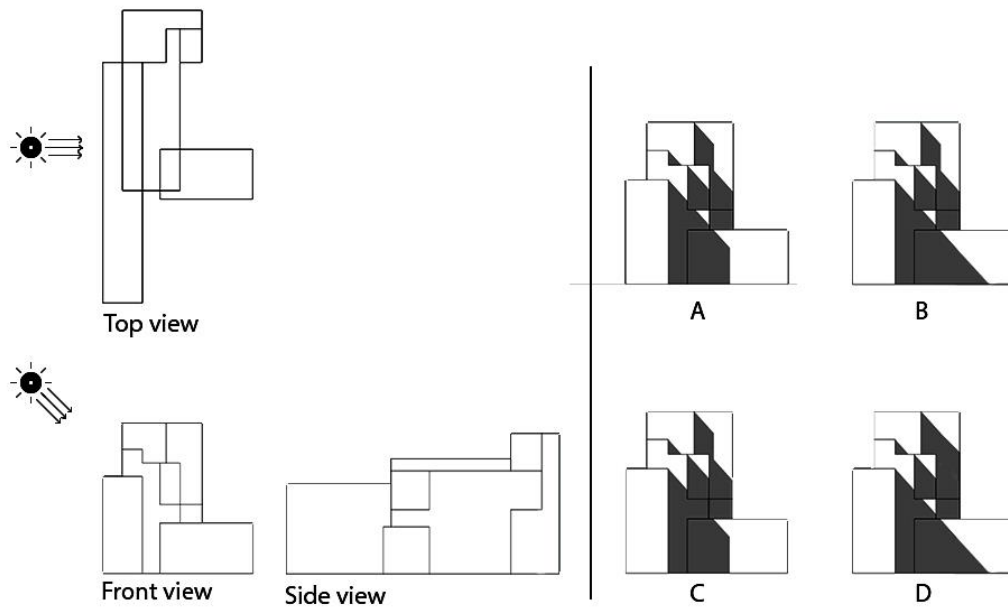
**Q.46** Which combination shows lunar eclipse?



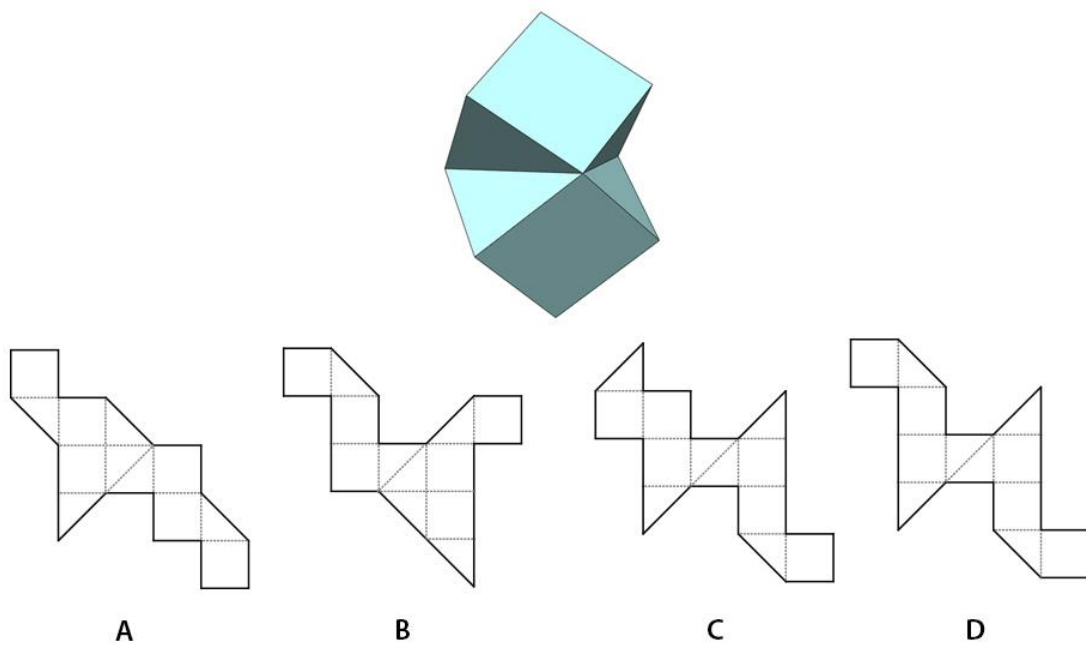
**Q.47** A boat is moving on the river and following the path as shown by the dashed line. Both the boatmen are facing front and rafting with equal force in the directions shown by the arrows in the options. Which of the options will help the boat to take a right turn?



**Q.48** Select the correct sunshade pattern on the illustrated structure. Assume Sun at 45 degree on left as shown.

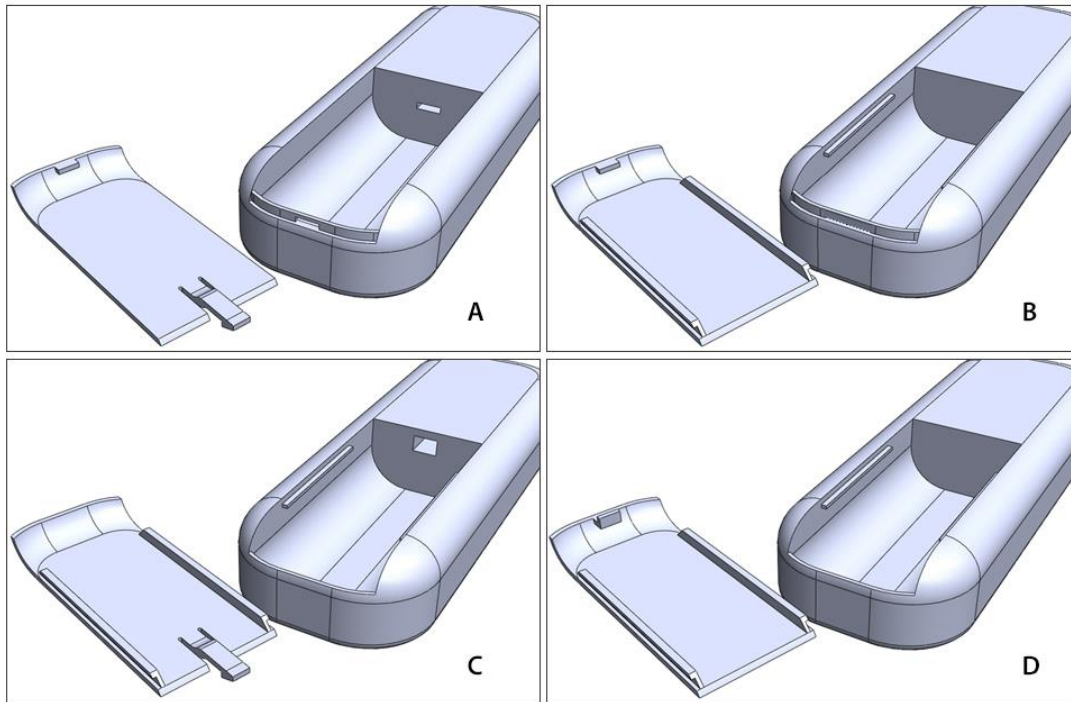


**Q.49** Which option, when folded, will result in the solid shown?

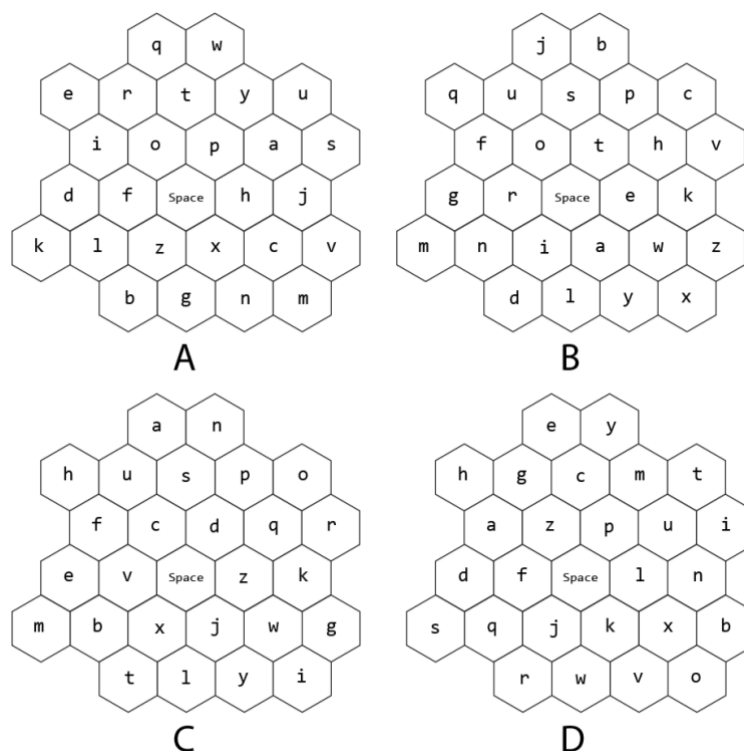




**Q.50** The options show designs for a remote control and its battery cover. Which design will be feasible?

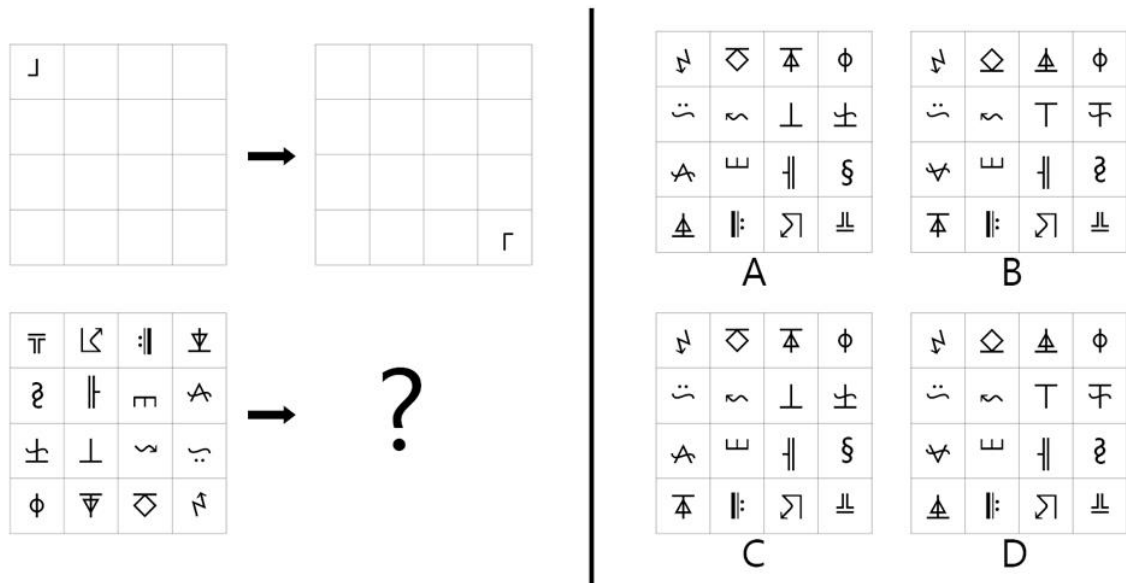


**Q.51** Four keyboard layouts were designed to enter text on touch-screen mobile phones. Which of these layouts has the shortest finger travel distance for entering text in the English language? Assume, the mobile is held vertically in the left hand, and a right-handed user presses the keys using only the index finger of the right hand.

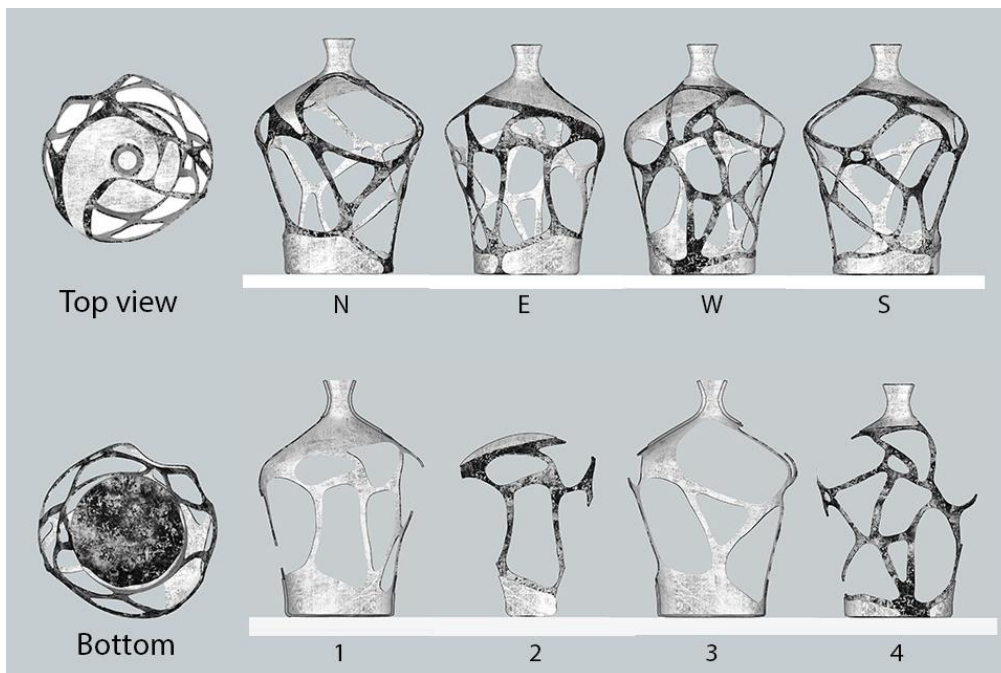




**Q.52**



**Q.53** Refer to all the sides of a vase shown below.



Select the correct order of sectional faces.

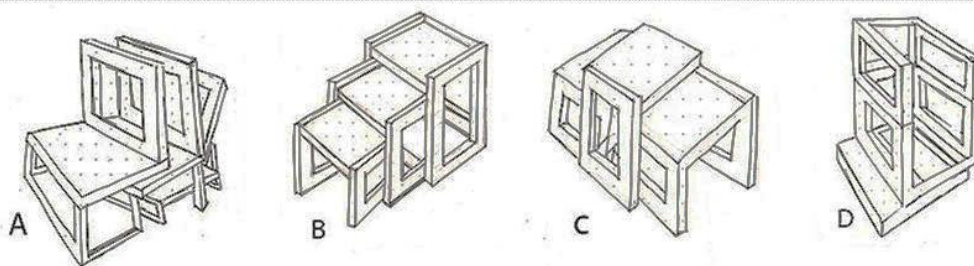
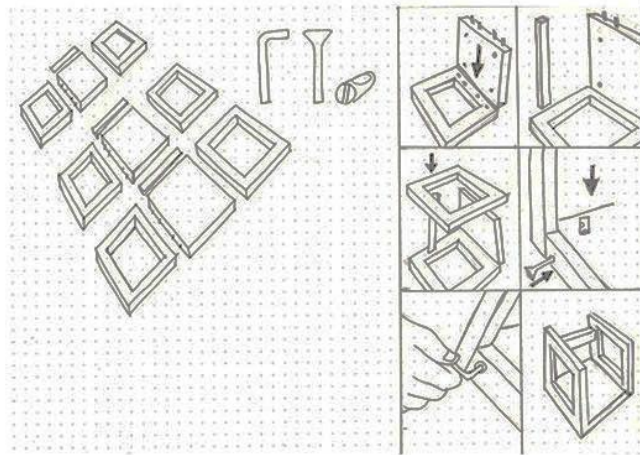
A 1. Inside eastward, 2. Outside westward mirrored, 3. Inside westward, 4. Outside westward mirrored

B 1. Inside westward, 2. Outside eastward mirrored, 3. Inside southward mirrored, 4. Outside westward mirrored

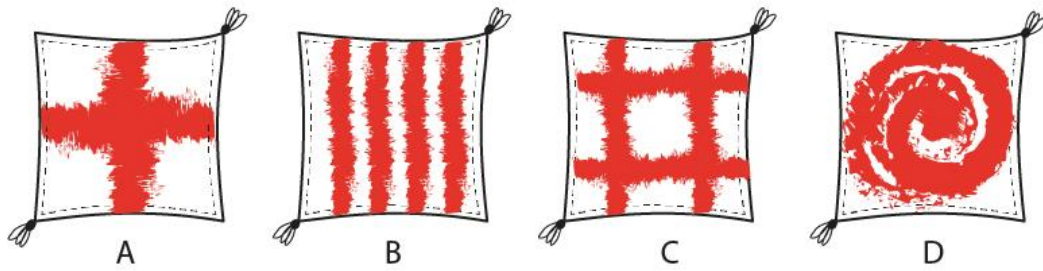
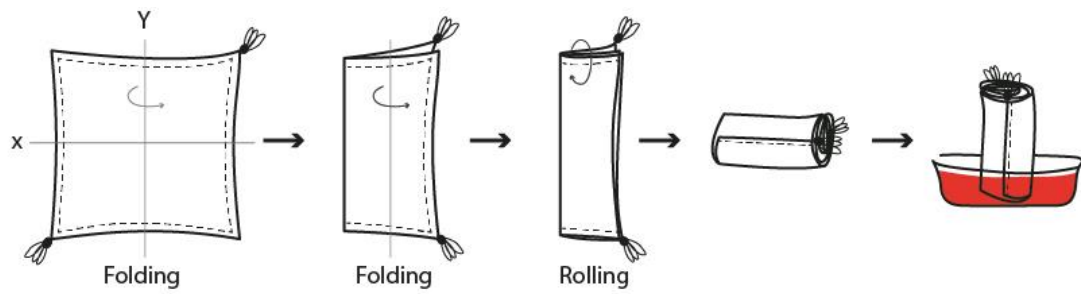
C 1. Inside westward mirrored, 2. Outside eastward mirrored, 3. Inside southward, 4. Outside northward

D 1. Inside southward, 2. Outside eastward mirrored, 3. Inside westward, 4. Outside northward

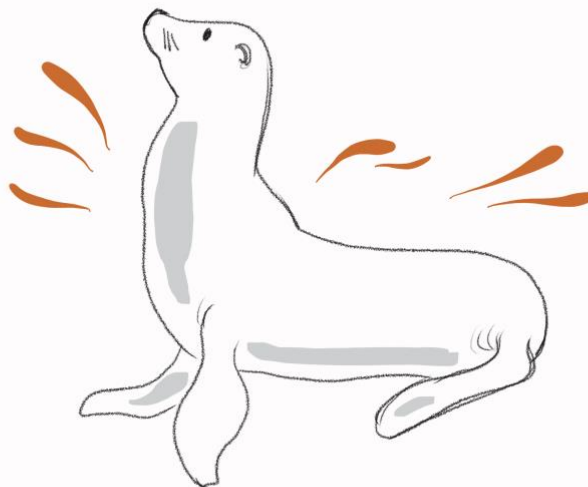
**Q.54** Which of the options can be made by following the instructions given in the image below?



**Q.55** Aru bought a new cushion cover from the market. Though the material is cotton, she was not happy with the plain cushion cover and planned to dye it with a colour. She followed the process as shown in the diagram, starting with folding the cover along the Y axis. After the first dye, she made the cushion cover dry and again did the same process, but this time started the folding along the X axis. Find out the pattern she created after the second dye.

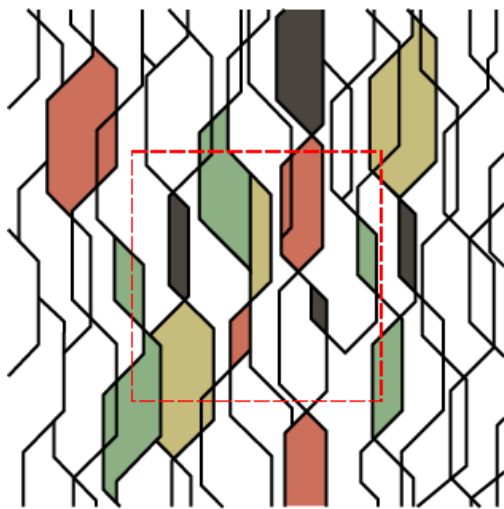


**Q.56** Select the correct option which lists the animals appearing in the GIF.



- A. Lizard, Dog, Swan
- B. Goat, Cat, Crocodile
- C. Dog, Swan, Seal
- D. Dog, Goat, lizard

**Q.57** Find the exact pattern highlighted in the red square.



A



B



C



D

**Q.58** A layout director of a newspaper was listening to music loops P, Q, R and S. Subsequently, the director created layouts 1, 2, 3 and 4 for the Music section of the newspaper. Indicate the correct pair of music loop and the layout.



P



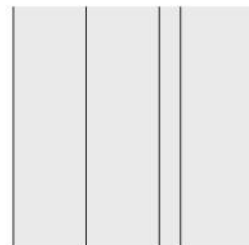
Q



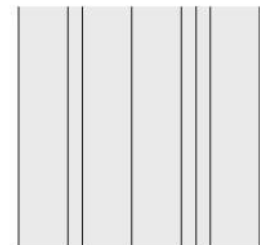
R



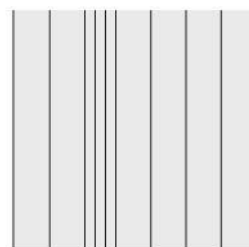
S



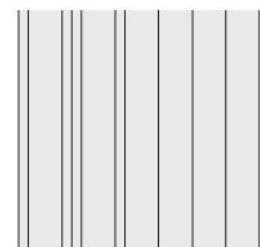
1



2



3



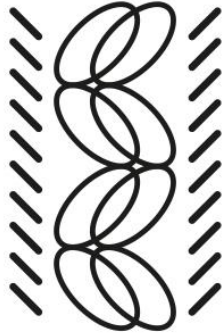
4

- A. P-4, Q-3, R-2, S-1
- B. P-2, Q-1, R-4, S-3
- C. P-3, Q-4, R-1, S-2
- D. P-1, Q-2, R-3, S-4

**Q.59** Shown below is a transparent roller stamp. Identify the print made from the roller.



A



B



C

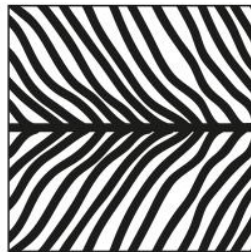


D

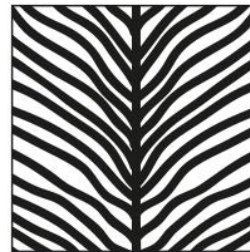
**Q.60** Find the odd one.



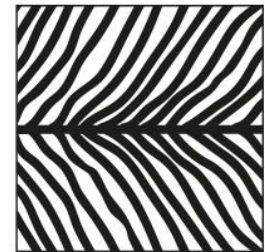
A



B



C



D

**Q.61** Shown below are visual lines that were decoded into names.



GAUTAMA BUDDHA



VIVEKANANDA



ALBERT EINSTEIN

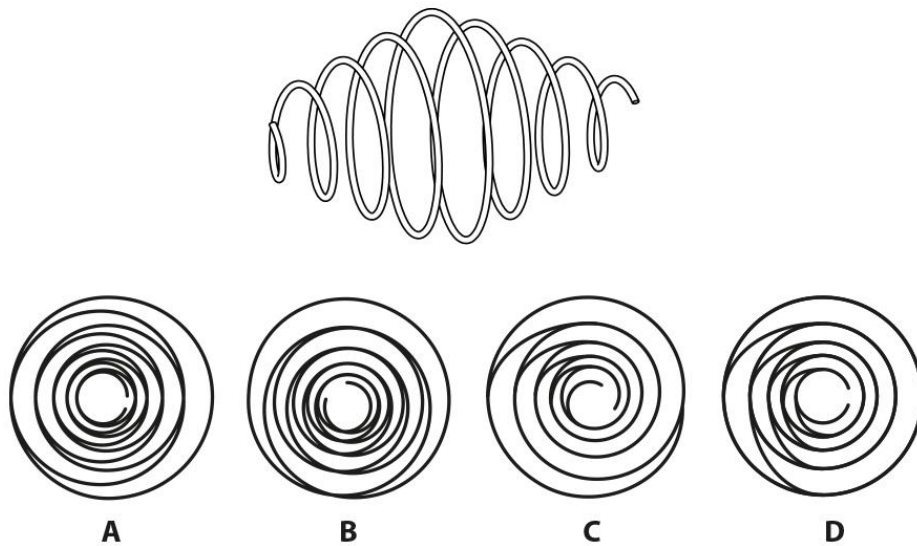


?

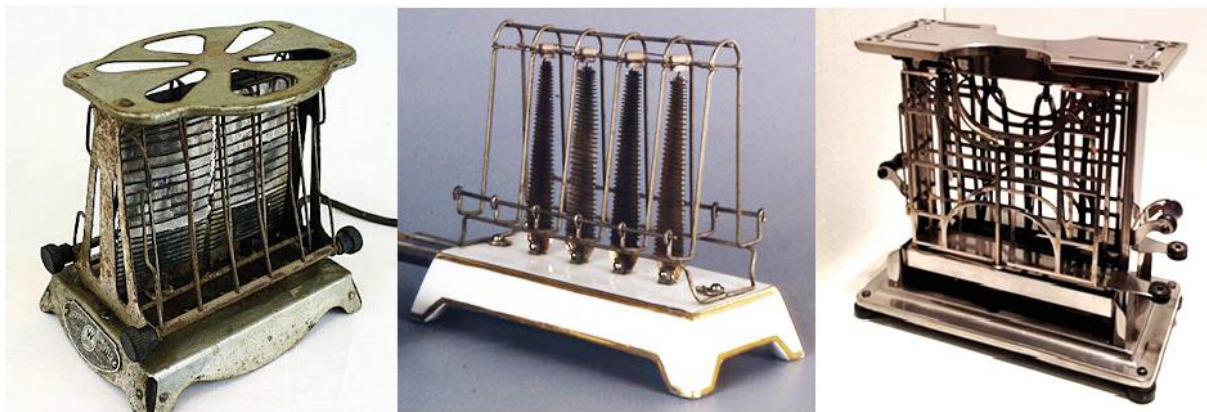
- A. RAGAVENDERAN
- B. RADHAKRISHNAN
- C. RAMANABHUSHAN
- D. THIRUVALLUVAN



**Q.62** Identify the side view of the spring.



**Q.63** What is the function of these objects?











- A. Measuring earthquakes
- B. Weaving cotton
- C. Toasting bread
- D. Burning wood

**Q.64** Cathy has less money than David. Cathy and David together have as much money as Alice and Bob together. Alice and David together have less money than Bob and Cathy together. What is the correct richest-poorest pairing?

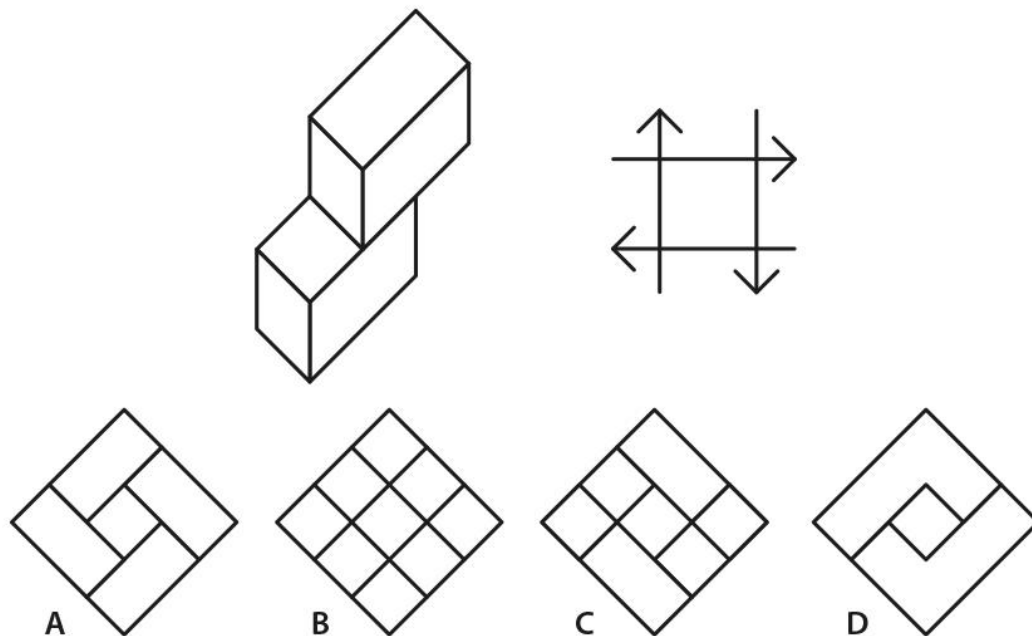
- A: Bob-Cathy
- B: Bob-Alice
- C: David-Cathy
- D: Cathy-Alice

Q.65

SUGAR = ?

- A  + 
- B  + 
- C  + 
- D  + 

**Q.66** Shown below is a 3D block. Four such blocks are interlocked in a square form. What will be the top view of the blocks after interlocking?





**Q.67** Which betel nut cutter will require less force to be applied to cut a betel nut?  
Consider the hinge points to be at the same line.



A



B



C




D

**Q.68**

 = **GOAT**

 = **LIZARD**

 = **TIGER**

 = **?**

- A. RAM
- B. MOTH
- C. BAT
- D. SNAKE

# PART B

## Sketching

(30 minutes – 60 marks)

Nandu is giving a dance exam in online mode in front of a laptop kept on a table. His mother is prompting from behind. While the exam is going on, his pet cat Poco is running around tumbling over a glass of water, a plate of biscuits and a few books. No one can stop Poco and the exam must go on.

**Visualize and draw the whole situation as if you are sitting on the floor witnessing the scene.**

### Note:

- Make pencil sketches only
- Do not use colours

### Evaluation Criteria:

- Observation
- Imagination
- Selection & composition of objects
- Quality of lines
- Presentation
- Attention to details

## UCEED 2023 - ANSWER KEY

### SECTION – A (NAT)

Q. No.	KEY RANGE	Q. No.	KEY RANGE	Q. No.	KEY RANGE	Q. No.	KEY RANGE	Q. No.	KEY RANGE
01	4	02	132.8 - 133.1	03	6	04	5	05	27
06	30	07	6	08	46	09	9	10	11
11	81	12	20.5 – 21.5	13	5.9 – 6.1	14	20	15	0.17 - 0.19
16	23	17	21	18	10				

### SECTION – B (MSQ)

Q.No.	KEYS	Q.No.	KEYS	Q.No.	KEYS	Q.No.	KEYS	Q.No.	KEYS
19	A,B,C	20	A,D	21	A,D	22	A,B,D	23	A,C
24	A,B,C	25	A,D	26	B,C,D	27	A,B,D	28	A,B,D
29	A,C	30	A,D	31	B,C,D	32	C,D	33	B,C
34	A,B	35	B,C	36	C,D				

### SECTION – C (MCQ)

Q.No.	KEY	Q.No.	KEY	Q.No.	KEY	Q.No.	KEY	Q.No.	KEY
37	C	38	B	39	A	40	C	41	C
42	D	43	B	44	A	45	B	46	B
47	D	48	D	49	D	50	C	51	B
52	B	53	B	54	B	55	C	56	C
57	D	58	C	59	D	60	D	61	B
62	A	63	C	64	B	65	C	66	A
67	C	68	A						