MATHEMATICS

Chapter 10: Visualising Solid Shapes

Important Questions

Multiple Choice Questions-

Question 1. The name of the shape is

(a) cylinder

(b) square

(c) circle

(d) triangle.

Question 2. The name of the shape is

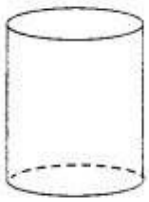
(a) sphere

(b) cylinder

(c) cone

(d) triangle.

Question 3. The name of the shape is



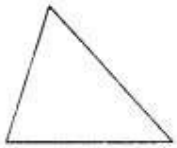
(a) cone

(b) sphere

(c) cuboid

(d) cylinder.

Question 4. The name of the shape



(a) triangle

(b) cone

(c) cylinder

(d) sphere

Question 5. The name of the shape is

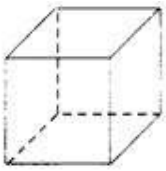
(a) cone

(b) circle

(c) cylinder

(d) cube.

Question 6. The name of the shape is



(a) cuboid

(b) cube

(c) square

(d) cylinder.

Question 7. The name of the shape is

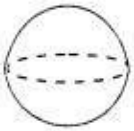
(a) cube

(b) cuboid

(c) sphere

(d) square.

Question 8. The name of the shape is



(a) circle

(b) sphere

(c) cylinder

(d) cone.

Question 9. A cuboid has how many faces ?

(a) 2

(b) 4

(c) 6

(d) 3.

Question 10. How many faces does a cube have ?

(a) 6

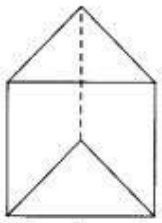
(b) 4

(c) 3

(d) 2.

Very Short Questions:

1. Draw any four 3-dimensional figures.
2. Verify Euler's formula for a right triangular prism.

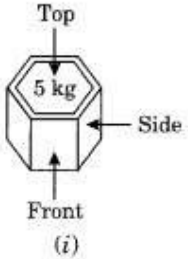


Triangular prism

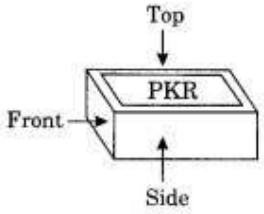
3. Find the number of vertices of hexagonal prisms.
4. Verify whether a polyhedron can have 10 faces, 20 edges and 15 vertices.
5. If F = 18 and V = 10, then find the value of E in Euler's formula.

Short Questions :

1. Draw the front, side and top views of the following 3-D figures.



(i)



(ii)

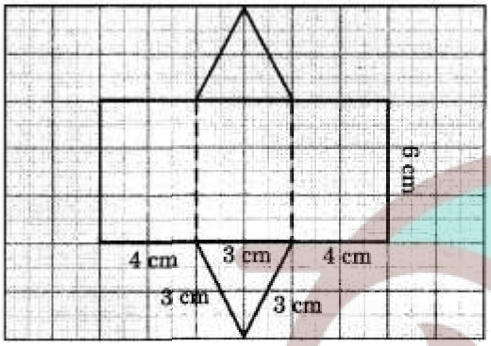
2. Draw the nets of the following polyhedrons.

(i) Cuboid

(ii) Triangular prism with a base equilateral triangle.

(iii) Square pyramid.

3. The given net is made up of two equilateral triangles and three rectangles.



(i) Name the solid it represents.

(ii) Find the number of faces, edges and vertices.

4. Using Euler's formula, fill in the blanks:

	Faces	**Vertices**	**Edges**
(a)	6	8	—
(b)	—	10	15
(c)	4	—	6
(d)	5	6	—
(e)	8	12	—
(f)	7	7	—

5. Name the solids that have:

(i) 4 faces

(ii) 8 triangular faces

(iii) 6 faces

(iv) 1 curved surface

(v) 5 faces and 5 vertices

(vi) 6 rectangular faces and 2 hexagonal faces

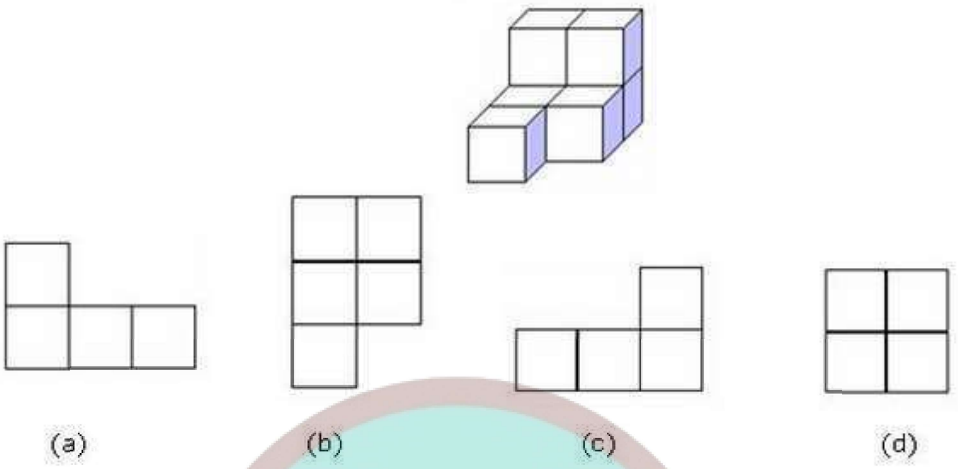
Long Questions :

1. Complete the table:

Solid	F	V	E	F + V	E + 2
Cuboid	—	—	—	—	—
Triangular pyramid	—	—	—	—	—
Triangular prism	—	—	—	—	—
Pyramid with square base	—	—	—	—	—
Prism with square base	—	—	—	—	—

2. Use isometric dot paper to sketch a rectangular prism with length 4 units, height 2 units and width 3 units.

3. **Identify the given views of the block:**



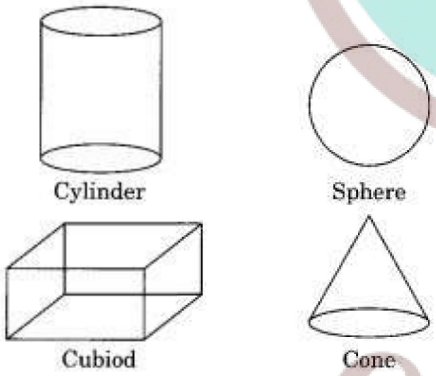
Answer Key-

Multiple Choice questions-

1. (b) square
2. (c) cone
3. (d) cylinder
4. (a) triangle
5. (b) circle
6. (b) cube
7. (b) cuboid
8. (b) sphere
9. (c) 6
10. (a) 6

Very Short Answer :

1.



2. Number of vertices (V) = 6

   Number of faces (F) = 5

   and number of edges (E) = 9

   Euler's formula:

   V + F – E = 2

   ⇒ 6 + 5 – 9 = 2

   ⇒ 2 = 2

   Hence, the formula is verified.

3. Number of vertices = 2 × Number of sides = 2 × 6 = 12

4. We have

   Number of faces F = 10

Number of edges E = 20

and number of vertices V = 15

Euler's formula:

V + F – E = 2

⇒ 15 + 10 – 20 = 2

⇒ 5 ≠ 2

Hence, it is not possible to have a polyhedron satisfying the above data.

5. We know that

V + F – E = 2

⇒ 10 + 18 – E = 2

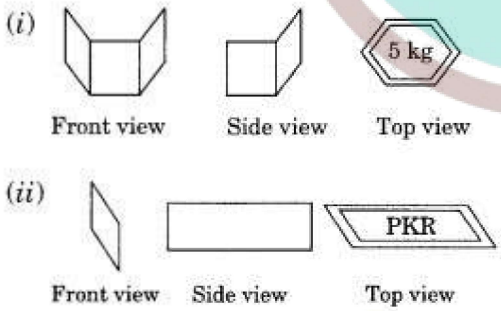
⇒ 28 – E = 2

⇒ E = 28 – 2 = 26

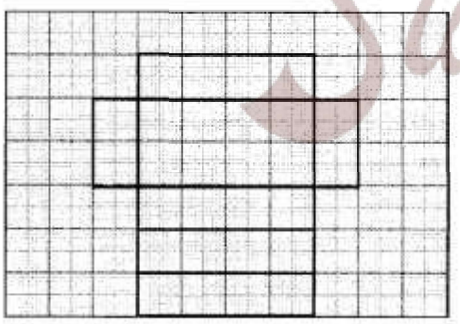
Hence, the required value of E = 26

Short Answer :

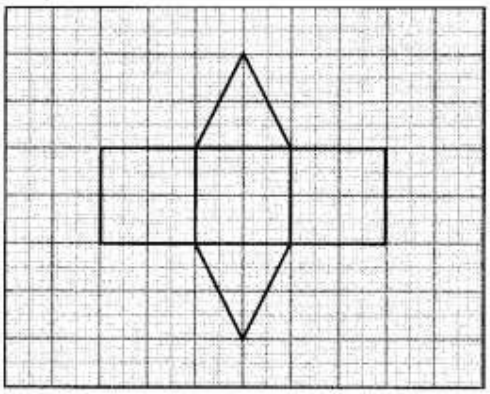
1.



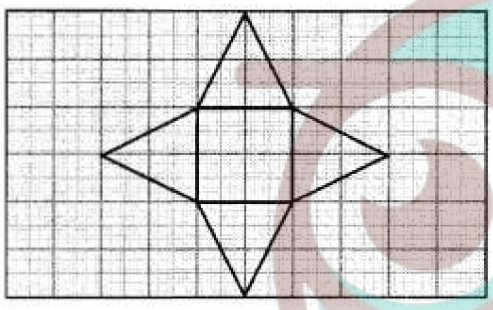
2. (i) The net pattern of cuboid



(ii) The net pattern of a triangular prism



(iii) Net pattern of square pyramid



3. (i) The given figure represents the net prims of the triangular prism

(ii) Number of faces = 5

Number of edges = 9

Number of vertices = 6

4. (a) F + V – E = 2

⇒ 6 + 8 – E = 2

⇒ 14 – E = 2

⇒ E = 14 – 2 = 12

(b) F + V – E = 2

⇒ F + 10 – 15 = 2

⇒ F – 5 = 2

⇒ F = 2 + 5 = 7

(c) F + V – E = 2

⇒ 4 + V – 6 = 2

⇒ V – 2 = 2

⇒ V = 2 + 2 = 4

(d) F +V – E = 2

⇒ 5 + 6 – E = 2

⇒ 11 – E = 2

⇒ E = 11 – 2 = 9

(e) F + V – E = 2

⇒ 8 + 12 – E = 2

⇒ 20 – E = 2

⇒ E = 20 – 2 = 18

(f) F + V – E = 2

⇒ 7 + 7 – E = 2

⇒ 14 – E = 2

⇒ E = 14 – 2 = 12

Hence (a) → 12, (b) → 7, (c) → 4, (d) → 9, (e) → 18, (f) → 12.

5. (i) Tetrahedron

(ii) Regular octahedron

(iii) Cube and cuboid

(iv) Cylinder

(v) Square and a rectangular pyramid

(vi) Hexagonal prism

Long Answer :

1.

Solid	F	V	E	F + V	E + 2
Cuboid	6	8	12	14	14
Triangular pyramid	4	4	6	8	8
Triangular prism	5	6	9	11	11
Pyramid with square base	5	5	8	10	10

Prism with square base	6	8	12	14	14

2. Steps:

1. Draw a parallelogram with sides 4 units and 3 units. This is the top of the prism (Fig. 1).

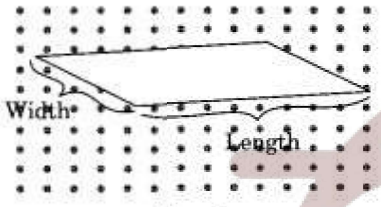


Fig. 1

2. Start at one vertex. Draw a line passing through two dots. Repeat for the other three vertices. Draw the hidden edges as a dashed line (Fig. 2).

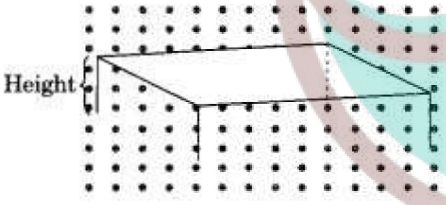


Fig. 2

3. Connect the ends of the lines to complete the prism (Fig. 3).

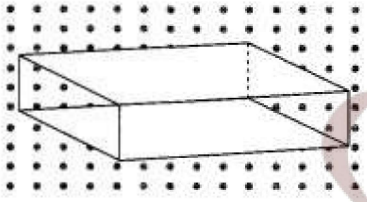


Fig. 3

3.

a. Left View

b. Top View

c. Right View

d. Front View.