Mathematics

Practice Test Paper 9

(Chapter 12: Surface Areas and Volumes)

Class X | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. The paper has four sections: A, B, C and D.
2. Section A - 5 marks; Section B - 8 marks; Section C - 9 marks; Section D - 3 marks.
3. Choose one correct option in Section A. Show the necessary steps and reasoning in Sections B, C and D.
4. Use $\pi = 22/7$ unless stated otherwise. Use of calculators is not allowed.

SECTION A

(5 questions × 1 mark = 5 marks)

1. A hemisphere of radius 3 cm is placed on a cube of edge 8 cm. The area of the cube still exposed is:

(A) 384 cm^2 (B) (384 + 9π) cm^2

(C) (384 − 9π) cm^2 (D) (384 − 18π) cm^2

2. Two cones of common base radius r and heights h_1 and h_2 are joined base to base. Their combined volume is:

(A) $\frac{1}{3}\pi r^2(h_1 + h_2)$ (B) $\pi r^2(h_1 + h_2)$

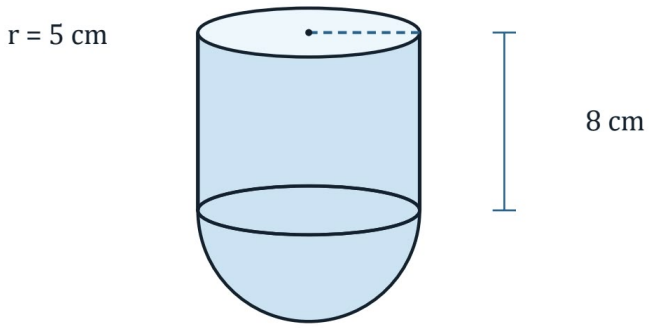
(C) $\frac{2}{3}\pi r^2(h_1 + h_2)$ (D) $\frac{1}{3}\pi r^2(h_1 - h_2)$

3. A hemispherical cavity has volume 18π cm^3. Its radius is:

(A) 2 cm (B) 6 cm

(C) 9 cm (D) 3 cm

4. The open vessel shown has a cylindrical part of height 8 cm and a hemispherical bottom of radius 5 cm. Its total depth is:



(A) 18 cm (B) 13 cm

(C) 10 cm (D) 8 cm

5. Two cubes of edge a are joined along a full face. The resulting solid has surface area:

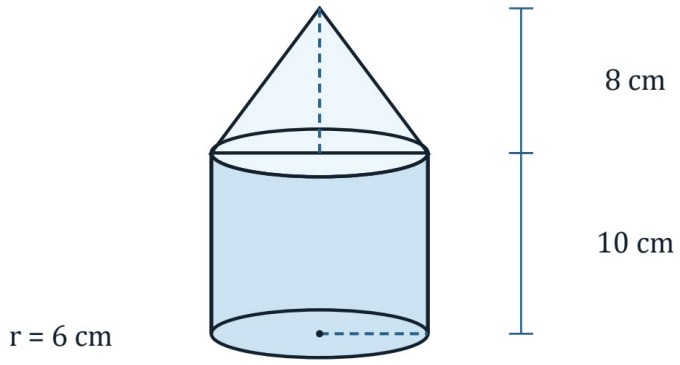
(A) $12a^2$ (B) $10a^2$

(C) $8a^2$ (D) $6a^2$

SECTION B

(4 questions × 2 marks = 8 marks)

6. The closed cylinder and cone shown have common radius 6 cm. The cylinder is 10 cm high and the cone is 8 cm high. Find the external area in terms of π, including the bottom.



7. A solid consists of a cube of edge 5 cm with a hemisphere of radius 2.1 cm fixed on it. Find the total exposed area, including the bottom.

8. A cylindrical block of radius 3 cm and height 8 cm has a conical cavity of the same radius and depth 6 cm. Find the volume remaining in terms of π.

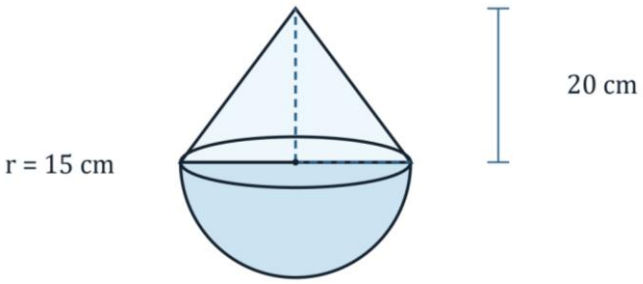
9. A cuboid of surface area 250 cm^2 has a hemisphere of radius 2.5 cm attached to one face. Find the combined exterior area, using π = 3.14.

SECTION C

(3 questions × 3 marks = 9 marks)

10. A cone of radius 7 cm and height 24 cm stands on a cylinder of radius 7 cm and height 10 cm. Its curved surfaces are painted at Rs 2 per cm^2. Find the painting cost. The bottom is not painted.

11. The toy shown consists of a cone of height 20 cm and a hemisphere of common radius 15 cm. Find its total height, external area and volume in terms of π where necessary.



12. A hollow cone of internal radius 5 cm and height 8 cm is full of water. Spherical beads of radius 0.5 cm are completely submerged, causing one-fourth of the water to overflow. Find the number of beads.

SECTION D

(Application Based Question - 3 marks)

13. A small metal component consists of a cylinder of radius 2 cm and height 6 cm capped by a hemisphere of the same radius. Use $\pi = 3.14$ and mass 6 g per cm^3.

(i) Find the cylinder volume.

(ii) Find the hemisphere volume.

(iii) Find the mass of the whole component.