Mathematics

Practice Test Paper 2

(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 π = 22/7 unless stated otherwise. Use of calculators is not allowed.

SECTION A

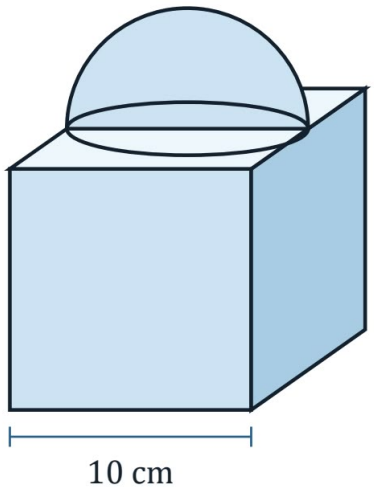
(5 questions × 1 mark = 5 marks)

1. For a cylinder of radius r and height h capped at both ends by hemispheres, the exterior area is:

(A) $2\pi rh + 2\pi r^2$ (B) $2\pi rh + 4\pi r^2$

(C) $2\pi rh + 6\pi r^2$ (D) $\pi rh + 4\pi r^2$

2. The largest hemispherical dome shown fits exactly on the top face of a cube of edge 10 cm. Its radius is:



(A) 10 cm (B) 20 cm

(C) 5 cm (D) 2.5 cm

3. A cone of volume 28 cm^3 is fixed without overlap to a hemisphere of volume 56 cm^3. Their combined volume is:

(A) 28 cm^3 (B) 56 cm^3

(C) 84 cm^3 (D) 112 cm^3

4. A cone is hollowed out from a cylinder with the same base and height. The ratio of removed volume to remaining volume is:

(A) 1 : 2 (B) 2 : 1

(C) 1 : 3 (D) 3 : 2

5. A cube of edge 6 cm has a hemispherical cavity of radius 2 cm. In terms of π, the volume removed is:

(A) $\frac{8\pi}{3}$ cm^3 (B) 8π cm^3

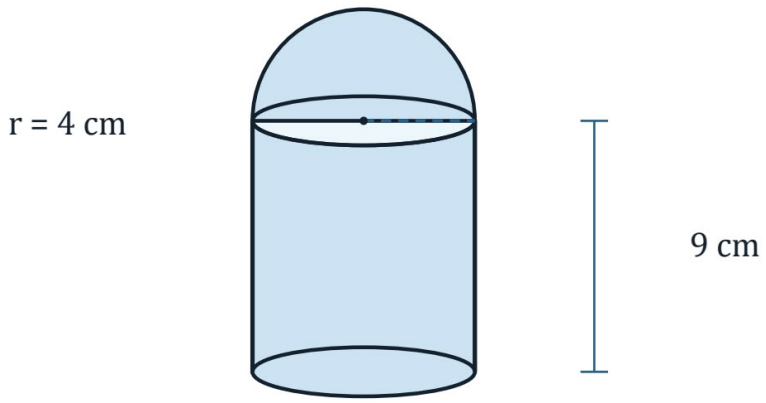
(C) 16π cm^3 (D) $\frac{16\pi}{3}$ cm^3

SECTION B

(4 questions × 2 marks = 8 marks)

6. A cubical block of edge 8 cm has a hemispherical depression of radius 3 cm in one face. Find its total surface area in terms of π.

7. The closed solid shown consists of a cylinder of radius 4 cm and height 9 cm with a hemisphere on top. Find its total external surface area in terms of π, including the bottom.



8. A cone and a hemisphere of equal radius are joined along their circular faces. Their curved surface areas are equal. Find the ratio of the cone radius to its height.

9. A cuboid measuring 10 cm × 8 cm × 5 cm has one conical cavity of radius 2 cm and depth 3 cm. Find the volume of material remaining in terms of π.

SECTION C

(3 questions × 3 marks = 9 marks)

10. A wooden toy consists of a cone of radius 7 cm and slant height 25 cm on a hemisphere of equal radius. Find its total height and total external surface area.

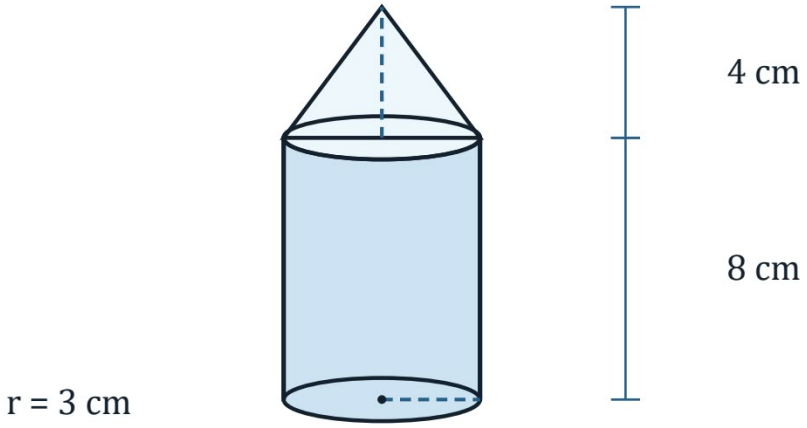
11. A capsule-shaped tank has internal radius 3 m and total length 14 m. Find its capacity in litres.

12. A solid cylinder of radius 6 cm and height 14 cm has a conical cavity with the same base and height. Find the volume remaining.

SECTION D

(Application Based Question - 3 marks)

13. A model silo has a cylindrical part of radius 3 m and height 8 m, with a conical roof of height 4 m, as shown. Treat the walls as having negligible thickness. Give volumes in terms of π.



(i) Name the solid forming the roof.

(ii) Find the volume of the cylindrical part.

(iii) Find the total enclosed volume.