Mathematics

Practice Test Paper 4

(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. The common radius of a cone and hemisphere is r. If the cone height is 2r, their volumes are in the ratio:

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

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

2. A cuboid of volume 500 cm^3 has two cavities of volume 15 cm^3 each. Its remaining volume is:

(A) 485 cm^3 (B) 470 cm^3

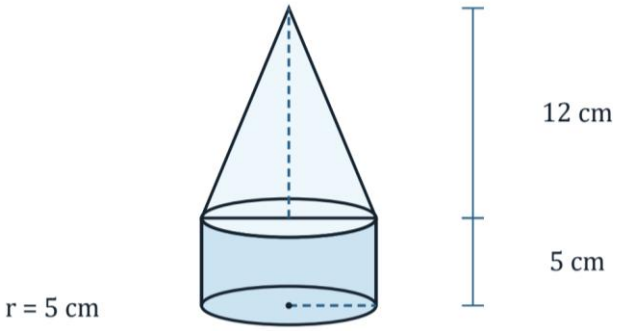
(C) 530 cm^3 (D) 450 cm^3

3. A cone and a cylinder of radius 4 cm are joined along their complete circular bases. The total area hidden by joining is:

(A) 8π cm^2 (B) 16π cm^2

(C) 64π cm^2 (D) 32π cm^2

4. The tent shown has a cylindrical wall 5 m high and a conical roof 12 m high. Its overall height is:



(A) 7 m (B) 12 m

(C) 17 m (D) 24 m

5. A conical cavity has radius 3 cm and depth 4 cm. Its slant height is:

(A) 4 cm (B) 7 cm

(C) 5 cm (D) 6 cm

SECTION B

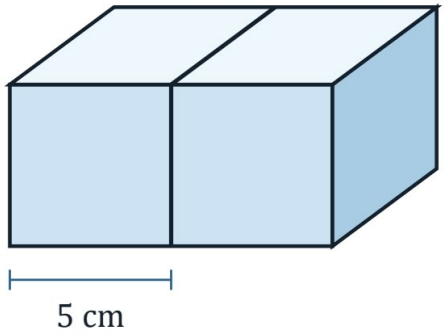
(4 questions × 2 marks = 8 marks)

6. A capsule has radius 7 mm and a cylindrical middle 20 mm long. Find its total external surface area.

7. A cone and a hemisphere share a radius of 7 cm. The cone is 3.5 cm high. Find their combined volume.

8. A cuboid 8 cm × 6 cm × 4 cm supports a hemisphere of radius 2 cm. Find the combined external area, including its bottom, in terms of π.

9. The two cubes shown, each of edge 5 cm, are joined along a complete face. Find the percentage decrease in total surface area compared with the two separate cubes.



SECTION C

(3 questions × 3 marks = 9 marks)

10. A cone of radius 6 cm and height 8 cm is mounted on a cylinder of radius 4 cm and height 12 cm. Find the total exposed area in terms of π, including the bottom and the overhanging ring beneath the cone.

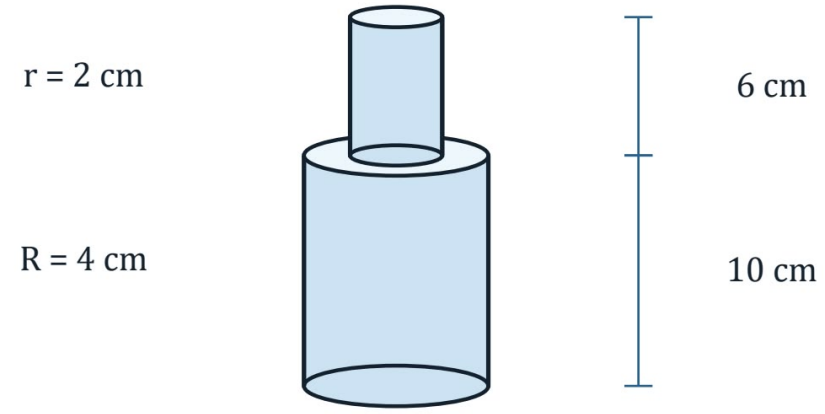
11. A wooden cylinder of radius 3 cm and height 10 cm has a hemispherical cavity of radius 3 cm scooped from each end. Find the volume of wood remaining in terms of π.

12. A hollow metal model consists of a cylinder with a cone at each end. Its internal radius is 1.5 cm, total length 12 cm, and each cone is 2 cm high. Find the enclosed volume, using π = 3.14.

SECTION D

(Application Based Question - 3 marks)

13. A solid stepped pillar consists of two coaxial cylinders joined at flat faces, as shown. The lower radius is 4 cm and height 10 cm; the upper radius is 2 cm and height 6 cm. Give volumes in terms of π.



(i) Find the lower cylinder volume.

(ii) Find the upper cylinder volume.

(iii) Find the pillar volume.