Mathematics

Practice Test Paper 8

(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 capsule of radius r and total length L, the external area simplifies to:

(A) $2\pi rL$ (B) πrL

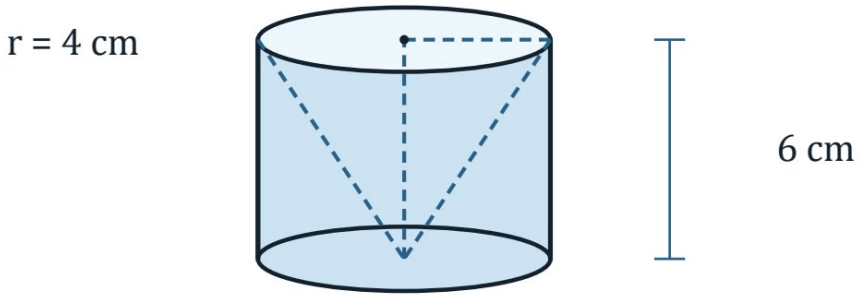
(C) $2\pi r(L + r)$ (D) $4\pi rL$

2. A closed cylinder has a hemisphere fitted on its top. How many plane circular faces remain on its exterior?

(A) 0 (B) 1

(C) 2 (D) 3

3. A conical cavity with the same radius and height is removed from the cylinder shown. The remaining volume is:



(A) 32π cm^3 (B) 48π cm^3

(C) 96π cm^3 (D) 64π cm^3

4. A cylinder has volume 90π cm^3. A cone with the same base and height is removed from it. The removed volume is:

(A) 60π cm^3 (B) 90π cm^3

(C) 30π cm^3 (D) 45π cm^3

5. A hemisphere and cone of common radius 4 cm form a toy 11 cm high. The cone height is:

(A) 15 cm (B) 11 cm

(C) 3 cm (D) 7 cm

SECTION B

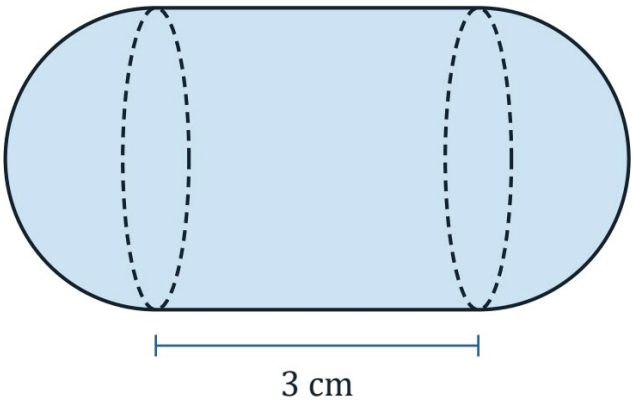
(4 questions × 2 marks = 8 marks)

6. A cube of edge 9 cm is attached to another cube of edge 6 cm, with the smaller face wholly on the larger face. Find their total external area.

7. A cuboid has dimensions 14 cm × 10 cm × 5 cm. A hemisphere of radius 3.5 cm is fixed to its top. Find the total exposed area, including the bottom.

8. An open vessel is a cylinder on a hemisphere, both with radius 3 cm. Its total capacity is 72π cm^3. Find the cylindrical height.

9. The capsule shown has radius 1.4 cm and cylindrical length 3 cm. Find its volume, giving an exact fractional answer in cm^3.



SECTION C

(3 questions × 3 marks = 9 marks)

10. A wooden article is a cylinder of radius 3.5 cm and height 10 cm with a hemispherical cavity of the same radius at each end. Find its total surface area.

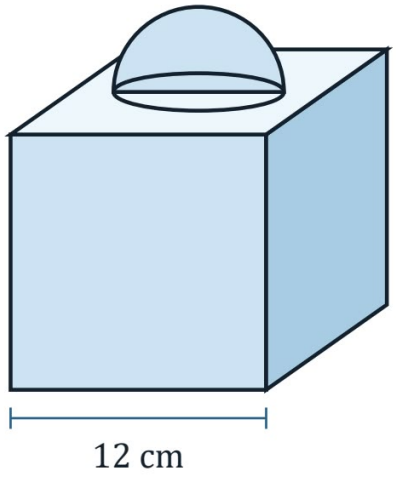
11. A solid cone of radius 4 cm and height 9 cm sits on a cylinder of the same radius and height 6 cm. Find the combined volume in terms of π. What fraction of this volume is the conical part?

12. A tank consists of a cylinder of radius 3 m and height 5 m with a hemisphere of radius 3 m below it. It is filled to 80% of its capacity. Find the water volume in terms of π and in litres.

SECTION D

(Application Based Question - 3 marks)

13. A cube of edge 12 cm has a hemisphere of radius 4 cm fixed on top, as shown. Its entire outer surface is painted. Give areas in terms of π where needed.



(i) Find the surface area of the cube before joining.

(ii) Find the area of one contact face.

(iii) Find the total exposed area.