Mathematics

Practice Test Paper 5

(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. Every linear dimension of a combined solid is doubled. Its volume becomes:

(A) 2 times
(B) 4 times
(C) 8 times
(D) 16 times

2. A cube has a hemisphere attached on one face. Which statement correctly describes the combined volume?

(A) Subtract the contact disc area
(B) Add the two volumes
(C) Subtract the hemisphere volume
(D) Add the curved areas

3. For a floorless tent consisting of a cylinder and a conical roof of the same radius, the canvas area is:

(A) $2\pi rh + \pi rl$

(B) $2\pi rh + \pi rl + \pi r^2$

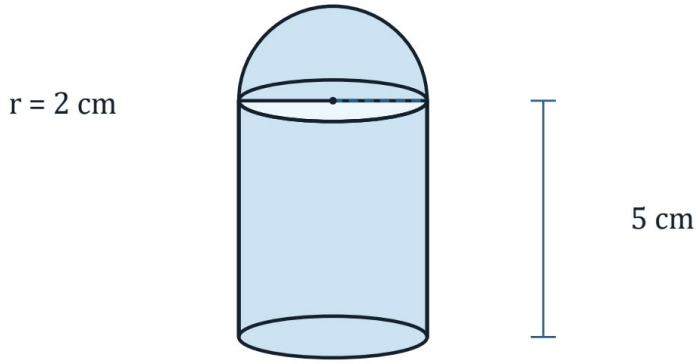
(C) $\pi r^2 h + \frac{1}{3}\pi r^2 h$

(D) $2\pi rh + 2\pi rl$

4. Two identical hemispheres are joined to form a sphere. The ratio of the sphere area to the sum of their separate total surface areas is:

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

5. The closed cylinder with a hemispherical top shown has radius 2 cm and cylindrical height 5 cm. Its external area, including the base, is:



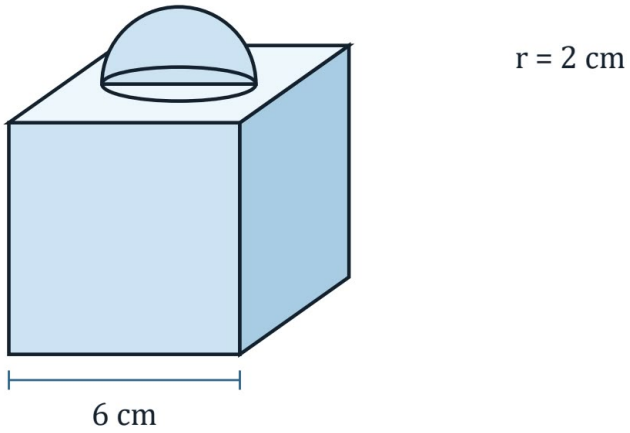
(A) 24π cm^2 (B) 28π cm^2

(C) 36π cm^2 (D) 32π cm^2

SECTION B

(4 questions × 2 marks = 8 marks)

6. The cube shown has edge 6 cm and supports a hemisphere of radius 2 cm. Find the volume of the combined solid in terms of π.



7. A hemispherical depression of radius 3.5 cm is made in one face of a cube of edge 7 cm. Find the increase in its surface area.

8. A cone of radius 6 cm and height 8 cm is fixed to a hemisphere of radius 6 cm. Find the ratio of the cone volume to the hemisphere volume.

9. A conical cavity of radius 3 cm and depth 6 cm is drilled into a block whose volume is 300 cm^3. Find the percentage of the block removed, using $\pi = 3.14$.

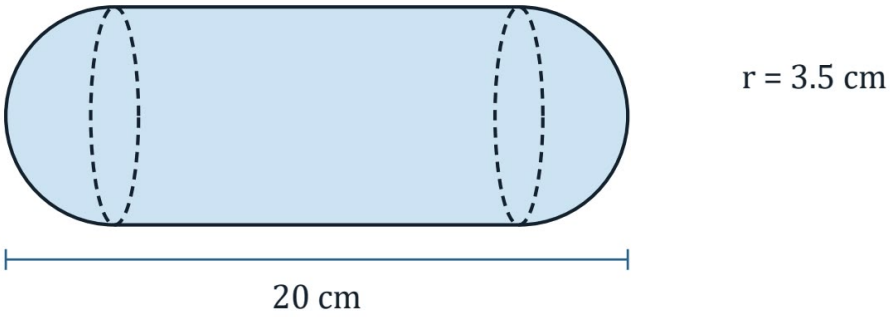
SECTION C

(3 questions × 3 marks = 9 marks)

10. A cylinder of radius 5 cm and height 15 cm is surmounted by a cone of the same radius. The solid has volume 475π cm^3. Find the cone height and the overall height.

11. A cylindrical vessel of radius 6 cm and height 14 cm contains a solid hemisphere of radius 6 cm fixed at the bottom. Find its water capacity in terms of π and as a decimal using π = 3.14.

12. The capsule-shaped solid shown has diameter 7 cm and total length 20 cm. Find its volume.



SECTION D

(Application Based Question - 3 marks)

13. A wooden pen stand measures 12 cm × 8 cm × 3 cm. It has four conical holes, each of radius 0.5 cm and depth 2 cm. Express answers in terms of π where needed.

(i) Find the original block volume.

(ii) Find the volume of one conical hole.

(iii) Find the volume of wood remaining.