Mathematics — Ganita Manjari

Chapter 14 Test 2

Math of Space: Surface Area and Volume

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. Choose one option in A; show working in B–D.
2. No calculators. Leave π exact unless stated. Ignore thickness unless specified.
3. Figures are not to scale; cones and cylinders are right circular.

SECTION A

(5 questions × 1 mark = 5 marks)

1. A cone and a cylinder have equal base radii and equal heights. What is the ratio of their volumes, cone to cylinder?

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

2. Which area must be added to a cylinder's curved surface area to obtain its total surface area when both ends are closed?

(A) πr^2 (B) $2\pi rh$
(C) $4\pi r^2$ (D) $2\pi r^2$

3. A hemisphere has radius r. What is the area of its flat base?

(A) πr^2 (B) $2\pi r^2$
(C) $3\pi r^2$ (D) $4\pi r^2$

4. A vessel has capacity 0.002 m^3. How many litres does it hold?

(A) 0.2 litre
(B) 20 litres
(C) 2 litres
(D) 200 litres

5. A cylinder's curved surface is unrolled into a rectangle. Which pair gives its dimensions?

(A) r, h (B) $2\pi r, h$
(C) $\pi r^2, h$ (D) $2r, 2h$

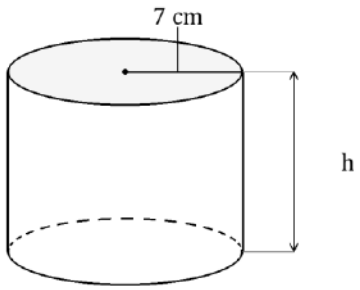
SECTION B

(4 questions × 2 marks = 8 marks)

6. A cylinder has radius 5 cm and curved surface area 140π cm^2. Find its height.

7. A closed cylindrical tin has curved area 64π cm^2 and total surface area 96π cm^2. Find its radius.

8. The cylinder in figure holds 1848 cm^3. Find its height. Use $\pi = \frac{22}{7}$.



9. A cuboid is twice as long as it is wide and is 5 cm high. Its volume is 360 cm^3. Find its length and width.

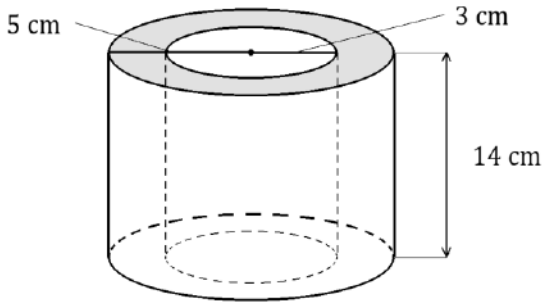
SECTION C

(3 questions × 3 marks = 9 marks)

10. Cylinders A and B have radii 2 cm and 3 cm, and heights 18 cm and 8 cm. Compare their volumes and curved surface areas.

11. A cylinder's curved area is four times the area of one base. Express its height in terms of its radius, then find its volume when $r = 3$ cm.

12. The uniform hollow pipe in figure is 14 cm long. Find the metal's cross-sectional area, metal volume and internal capacity.



SECTION D

(1 application question × 3 marks = 3 marks)

13. An empty cylindrical tank has internal radius 0.7 m and height 2 m. Water enters at 22 litres/minute. Find the filling time. Use $\pi = \frac{22}{7}$.