Mathematics — Ganita Manjari

Chapter 14 Test 8

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. Coating costs ₹8 per 100 cm^2. What is the cost for 250 cm^2?

(A) ₹20 (B) ₹200
(C) ₹32 (D) ₹2000

2. Removing a thin lid from a box changes which pair of quantities?

(A) Area and capacity both decrease (B) Area unchanged; capacity decreases
(C) Area decreases; capacity unchanged (D) Area and capacity both increase

3. A cylinder's circumference is 20 cm. A paper label needs a 1 cm overlap. What length must wrap around it?

(A) 19 cm (B) 20 cm
(C) 40 cm (D) 21 cm

4. A cylinder wrapper is cut with its wrap length equal to the base diameter. What happens when it is wrapped once?

(A) It fits exactly (B) A gap remains
(C) Its ends overlap (D) It forms a cone

5. A cone's paper surface is opened into a sector without stretching. What happens to its area?

(A) Doubles (B) Halves
(C) Stays unchanged (D) Becomes π times as large

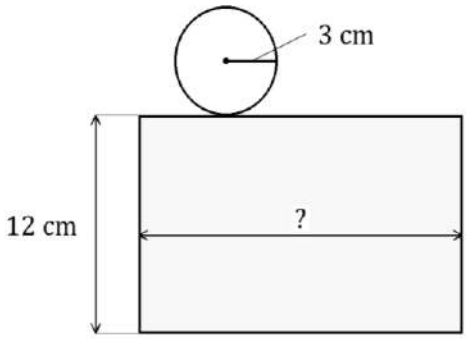
SECTION B

(4 questions × 2 marks = 8 marks)

6. An open-top cuboidal tray measures 6 × 4 × 3 cm. Find the sheet area and its cost at ₹0.50 per cm^2.

7. A thin hemispherical bowl of radius 3 cm is coated inside and outside. Find the coating area and cost at ₹5 per cm^2.

8. Find the sheet area for the container formed by the net in figure. From 300 cm^2, how much remains? Use $\pi = 3.14$.

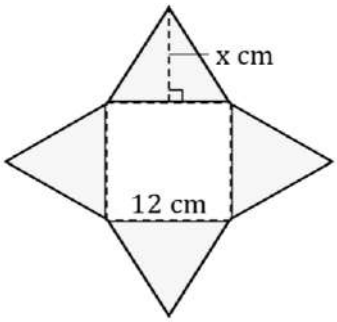


9. A conical hat has radius 3 cm and slant height 5 cm. Its flat brim extends to radius 5 cm. Find the total sheet area.

SECTION C

(3 questions × 3 marks = 9 marks)

10. The net of a right square pyramid in figure costs ₹768 at ₹2 per cm^2. Find x and the pyramid's perpendicular height.



11. A closed solid cylinder of radius 4 cm and height 10 cm is cut along a plane through its axis. Find both pieces' total exposed area.

12. A 22×14 cm sheet is rolled in two orientations into open-ended cylinders. Compare their curved areas and volumes. Use $\pi = \frac{22}{7}$.

SECTION D

(1 application question × 3 marks = 3 marks)

13. A cubical gift box of edge 10 cm needs wrapping paper with 10% extra. Sheets measure 30×25 cm and cost ₹4 each. Cutting and joining are allowed.

(i) Find the paper area needed.
(ii) Find the minimum number of sheets.
(iii) Find the cost.