Mathematics — Ganita Manjari

Chapter 14 Test 5

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 pyramid has a pentagonal base. How many triangular lateral faces does it have?

(A) 4 (B) 5
(C) 6 (D) 10

2. A pyramid's base area is 18 cm^2 and perpendicular height is 5 cm. What is its volume?

(A) 15 cm^3 (B) 90 cm^3
(C) 30 cm^3 (D) 270 cm^3

3. Which area is added to a pyramid's lateral surface area to obtain its total surface area?

(A) Base perimeter (B) Perpendicular height
(C) Twice the base area (D) Base area

4. A sphere has diameter 6 cm. What is its surface area?

(A) 36π cm^2 (B) 12π cm^2
(C) 9π cm^2 (D) 144π cm^2

5. A cone and a pyramid have equal volumes and equal perpendicular heights. Which quantities must be equal?

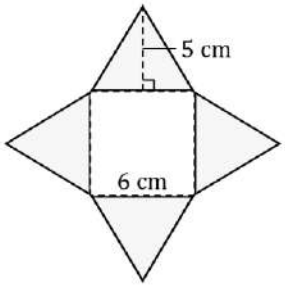
(A) Base areas (B) Base perimeters
(C) Slant heights (D) Total surface areas

SECTION B

(4 questions × 2 marks = 8 marks)

6. A pyramid's base is a right triangle with perpendicular sides 6 cm and 8 cm. Its volume is 96 cm^3. Find its perpendicular height.

7. The net in figure has a square base and four congruent triangular faces. Find the pyramid's lateral area and total surface area.



8. Two pyramids have equal volumes and base areas 25 cm^2 and 40 cm^2. Find their height ratio, in that order, and state which is taller.

9. A pyramid has a rhombus base with diagonals 10 cm and 12 cm. Its perpendicular height is 9 cm. Find its volume.

SECTION C

(3 questions × 3 marks = 9 marks)

10. A rectangular pyramid has base 30 cm × 12 cm. Its apex is 8 cm directly above the base centre. Find both face altitudes and the lateral area.

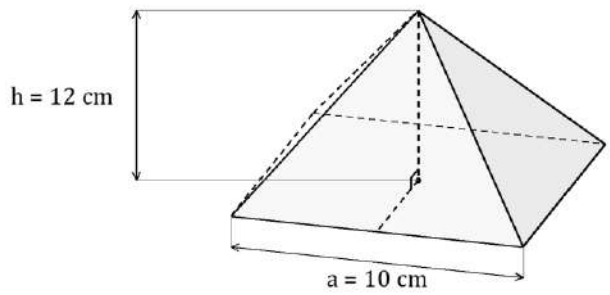
11. A cone's base circle is inscribed in a square pyramid's base. Both solids have equal perpendicular heights. Find the cone-to-pyramid volume ratio.

12. A pyramid has height 12 cm and volume 160 cm^3. Its rectangular base sides are in the ratio 2:5. Find both base dimensions.

SECTION D

(1 application question × 3 marks = 3 marks)

13. The square-pyramidal display cover in figure has its apex directly above the base centre. Its base is left open.



(i) Find the slant height of a triangular face.
(ii) Find the sheet area needed, ignoring seams.
(iii) Find the volume enclosed beneath the cover.