Mathematics

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(Chapter – 14) (Math of Space: Surface Area and Volume) (Assignment 3)

(Class – 9)

Name _____ Date _____

Answer all 15 questions. Choose one option for each MCQ. Show your working. Use $\pi = 22/7$ unless specified otherwise. Leave answers in terms of π when asked.

Section A: Multiple Choice Questions

1. Two cubes each of volume 125 cm^3 are joined end to end. Find the surface area of the resulting cuboid.

(a) 150 cm^2 (b) 200 cm^2
(c) 250 cm^2 (d) 300 cm^2

2. Suppose you have a cup in the shape of a right circular cone. Fill it with water to half the depth of the cone.

What fraction of the volume of the cup is occupied by the water?



(a) 1/2 (b) 1/4
(c) 1/8 (d) 3/4

3. You are given two options: (A) one chocolate cube of side 50 mm, (B) hundred chocolate cubes of side 10 mm. Which option gives you more chocolate?

(a) Option A (b) Option B
(c) Both give the same amount. (d) Cannot be compared.

4. When the curved surface of a cone is unrolled, it forms a sector. The radius of this sector equals the cone's:

(a) base radius. (b) diameter.
(c) perpendicular height. (d) slant height.

5. If the surface area of a sphere becomes four times its original value, its volume becomes:

(a) twice the original. (b) four times the original.
(c) eight times the original. (d) sixteen times the original.

Section B: Very Short Answer Questions

6. Write the formula for the surface area and the volume of a cube.

Answer:

7. What is the area of the curved surface of a cylinder?
Let its base radius be r and height be h.

Answer:

8. A cube of integer side length a is made of unit cubes. Write an expression giving the number of unit cubes to be added to make a cube of side length a + 1.

Answer:

9. A tank contains 0.02 m^3 of water. Express this volume in litres.

Answer:

10. A cone and a cylinder have the same base radius and height. How many full cones of water fill the cylinder?

Answer:

Section C: Short and Long Answer Questions

11. The radii of two cylinders are in the ratio 2:3, and their heights are in the ratio 3:2. Find (a) the ratio of their volumes, and (b) the ratio of their curved surface areas.

Answer:

12. An open rectangular aquarium has internal length 50 cm, width 30 cm and height 40 cm. Ignoring thickness, find the glass area needed for its base and four sides. How many litres of water does it hold when three quarters full?

Answer:

13. A right square pyramid has base edge 10 cm and perpendicular height 12 cm. Its face slant height is 13 cm. Find its volume and total surface area.

Answer:

14. A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.

Answer:

15. Metal spheres, each of radius 2 cm, are packed into a rectangular box of internal dimensions 16 cm × 8 cm × 8 cm. When 16 spheres are packed, the box is filled with preservative liquid. Find the volume of this liquid. Round your answer to the nearest integer.

Answer: