Mathematics

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(Chapter – 14) (Math of Space: Surface Area and Volume) (Assignment 1)

(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. The volume of a cube is 64 cm^3. What is its total surface area?

(a) 64 cm^2 (b) 96 cm^2
(c) 128 cm^2 (d) 384 cm^2

2. Find the curved surface area of a right circular cone whose slant height is 10 cm and base radius is 7 cm.

(a) 70 cm^2 (b) 154 cm^2
(c) 220 cm^2 (d) 440 cm^2

3. The diameter of the moon is approximately one fourth the diameter of the earth. Given that the moon and earth are both roughly spherical, find the ratio of their surface areas.

(a) 1 : 4 (b) 1 : 8
(c) 1 : 16 (d) 1 : 64

4. A thin cylindrical container of radius r and height h is open at the top. Which expression gives the area of material used, ignoring thickness?

(a) $2\pi rh$ (b) $2\pi rh + \pi r^2$
(c) $2\pi rh + 2\pi r^2$ (d) $\pi r^2 h$

5. A pyramid has base area 48 cm^2 and perpendicular height 9 cm. Its volume is:

(a) 144 cm^3 (b) 432 cm^3
(c) 48 cm^3 (d) 1296 cm^3

Section B: Very Short Answer Questions

6. How many small cubes with side 20 cm can be packed tight in a cubical box with side 2 m?

Answer:

7. A cone has a height of 15 cm. If its volume is 1570 cm^3, find the radius of the base. Use $\pi = 3.14$.

Answer:

8. A ball bearing has a radius of 0.7 cm. Find its surface area.

Answer:

9. Convert 2.5 litres into cubic centimetres.

Answer:

10. The edge of a cube is tripled. By what factors do its total surface area and volume change?

Answer:

Section C: Short and Long Answer Questions

11. Two cylinders, A and B, are given. The radius of cylinder B is twice that of cylinder A, and the height of cylinder B is half that of cylinder A. Find the ratio of the curved surface area of A to the curved surface area of B. Also find the ratio of the volume of A to the volume of B.

Answer:

12. A closed cylindrical tin has radius 7 cm and height 10 cm. Find its total surface area and capacity in cubic centimetres.

Answer:

13. A hemispherical bowl has internal radius 3 cm. How much water can it hold when full? Use π = 3.14 and ignore the thickness.

Answer:

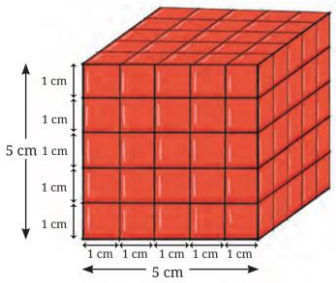
14. A cube of side 5 cm is painted on all its faces. If it is sliced into 1 cm^3 cubes, how many of these 1 cm^3 cubes have

(i) exactly three faces painted?

(ii) exactly two faces painted?

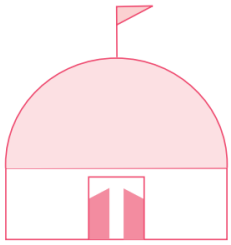
(iii) exactly one face painted?

(iv) no face painted?



Answer:

15. The hemispherical dome of a building needs to be painted (see figure). If the circumference of the base of the dome is 35.2 m, find the cost of painting it, given the cost of painting is ₹ 10 per 100 cm^2.



Answer: