Mathematics

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(Chapter – 14) (Math of Space: Surface Area and Volume) (Assignment 2)
(Class – 9)

Name _____ Date _____

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

Section A: Multiple Choice Questions

1. The dimensions of a godown are 40 m × 25 m × 10 m. If it is filled with cuboidal boxes, each of dimensions 2 m × 1.25 m × 1 m, then find the number of boxes.

(a) 400
(b) 2000
(c) 4000
(d) 10,000

2. Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m.

Choose the answer in terms of π.

(a) 252π m^2
(b) 396π m^2
(c) 504π m^2
(d) 792π m^2

3. The radius of a sphere is increased by x%. The volume of the sphere increases by 72.8%. Find the value of x.

(a) 10%
(b) 15%
(c) 20%
(d) 24%

4. The radius of a cylinder is doubled while its volume is kept unchanged. What must happen to its height?

(a) It is halved.
(b) It is doubled.
(c) It stays the same.
(d) It becomes one fourth.

5. Which expression gives the total surface area of a solid hemisphere of radius r, including its circular base?

(a) $2\pi r^2$
(b) $3\pi r^2$
(c) $4\pi r^2$
(d) $(2/3)\pi r^3$

Section B: Very Short Answer Questions

6. The surface areas of the three faces of a cuboid that meet at one of the corners of the cuboid are 6 cm^2, 15 cm^2, and 10 cm^2 respectively. What is the volume of the cuboid?

Answer:

7. The edge of a cube measures r cm. The largest possible right circular cylinder is cut out of the cube. What do you think is the volume of the cylinder (in cm^3)?

Answer:

8. Two solid spheres made of the same metal have weights 5920 g and 740 g. Determine the radius of the larger sphere, if the diameter of the smaller one is 5 cm.

Answer:

9. Each face of a cube has area 9 cm^2. Find its total surface area without first finding its edge length.

Answer:

10. A pyramid's base area is doubled and its perpendicular height is halved. How does its volume change?

Answer:

Section C: Short and Long Answer Questions

11. The curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. Find (i) the radius of the base, (ii) the total surface area of the cone.

Answer:

12. A right circular cone has radius 9 cm and perpendicular height 12 cm. Find its slant height, curved surface area, total surface area and volume. Leave areas and volume in terms of π.

Answer:

13. A metal sphere of radius 6 cm is melted and recast into smaller spheres, each of radius 2 cm. How many complete spheres are formed, assuming no metal is lost?

Answer:

14. A solid metallic cube of side 12 cm is melted and recast into solid cylindrical rods, each having radius 2 cm and height 12 cm. Find:

(i) the volume of the cube,

(ii) the volume of one cylindrical rod,

(iii) the approximate number of complete cylindrical rods that can be formed. ($\pi \approx \frac{22}{7}$)

Answer:

15. A cube of side 4 cm is cut into cubes of side 1 cm. What is the ratio of the surface areas of the original cube and all the cut-out cubes? (Note that there is no change in volume but a big change in the surface area. This property has major consequences in the biological world.)

Answer: