

Chapter 12 Surface area and volume

UNIT TEST

Duration: 1 hour

Marks: 30

SECTION A

Each carry 1 mark

1. Two cones have their heights in the ratio 1:3 and radii in the ratio 3:1, then the ratio of their volumes is

- a) 1:3 b) 3:1 c) 2: 3 d) 3:2

2. A heap of rice is in the form of a cone of base diameter 24 m and height 3.5 m. How much canvas as cloth is required to just cover the heap?

- a) 105.5 m^2 b) 471.42 m^2 c) 173.5 m^2 d) None of these

3. If two cubes of edge 3cm each are joined end to end, then the surface area of the resulting cuboid is

- a) 90cm^2 b) 95cm^2 c) 92cm^2 d) 94cm^2

4. Assertion: Total surface area of the cylinder having radius of the base 14 cm and height 30 cm is 3872 cm^2 .

Reason: If r be the radius and h be the height of the cylinder, then total surface area = $(2\pi rh + 2\pi r^2)$.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

SECTION B

Each carry 2 marks

5. The area of the base of a right circular cylinder is 15400 cm^2 and its volume is 92400 cm^3 . Find the area of its curved surface.
6. Lead spheres of diameter 6 cm are dropped into a cylindrical beaker containing some water and are fully submerged. If the diameter of the beaker is 18 cm and the water rises by 40 cm, find the number of lead spheres dropped in the water.
7. Three cubes each of 5cm edge are joined end to end. Find the surface area of the resulting cuboid.

SECTION C

Each carry 3 marks

8. An iron pillar consists of a cylindrical portion 2.8 m high and 20 cm in diameter and a cone 42 cm high is surmounting it. Find the weight of the pillar, if 1 cm^3 of iron weighs 7.5 g.
9. From a solid cylinder whose height is 8 cm and radius 6 cm a conical cavity of height 8 cm and of base radius 6 cm is hollowed out. Find the volume of the remaining solid correct to the two places of decimal. Also, find the total surface area of the remaining solid. ($\pi = 3.1416$).

SECTION D

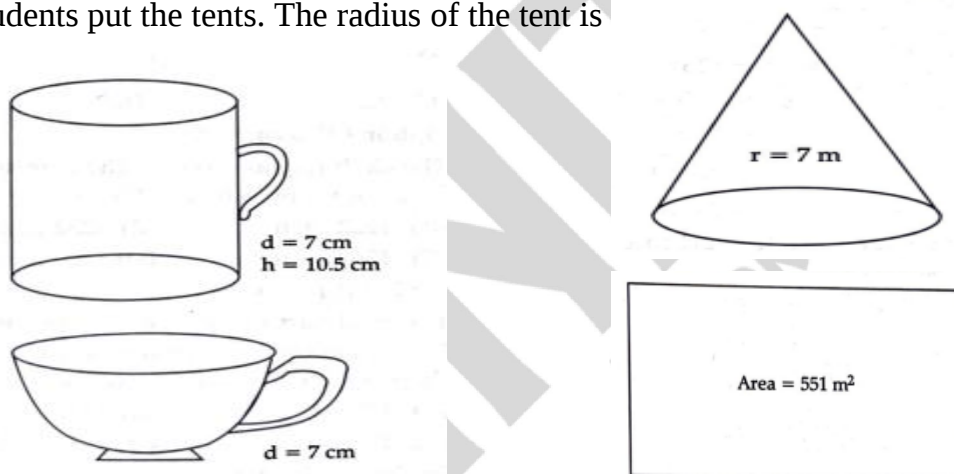
Each carry 5 marks

10. A solid consisting of a right cone standing on a hemisphere is placed upright in a right circular cylinder full of water and touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm, the radius of the hemisphere is 60 cm and height of the cone is 120 cm, assuming that the hemisphere and the cone have common base.

11. A toy is in the form of a right circular cylinder closed at one end and with hemisphere on the other end. The height and the radius of the base of the cylinder are 15cm and 6cm respectively. The radius of the hemisphere and the base of the cylinder are the same. Calculate the total surface area and the volume of the toy. If the toy is painted at the rate of ₹2.50 per 10cm^2 , find the cost of painting the toy. ($\pi = 3.14$)

SECTION E

12. Adventure camps are the perfect place for the children to practice decision making for themselves without parents and teachers guiding their every move. Some students of a school reached for adventure at Sakleshpur. At the camp, the waiters served some students with a welcome drink in a cylindrical glass and some students in a cylindrical glass and some in hemispherical cup whose dimensions are shown below. After that they went for a jungle trek which was enjoyable but tiring. As dusk fell, it was time to take shelter. Each group of four students was given a canvas of area 551m^2 . Each group had to make a conical tent to accommodate all the four students. Assuming that all the stitching and wasting incurred while cutting, would amount to 1m^2 , the students put the tents. The radius of the tent is



Based on the above information, answer the following questions:

- Calculate the volume of the cylindrical cup.
- Evaluate the volume of the hemispherical cup.

- iii) Find the height of the conical tent prepared to accommodate four students.
- iv) How much space on the ground is occupied by each student in the conical tent?

UNIT TEST

1. b) 3:1
2. b) 471.42 m^2
3. a) 90cm^2
4. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
5. 2640cm^2
6. 90
7. 350cm^2
8. 693 kg
9. 603.19cm^3 , 603.19cm^2
10. 1.1314m^3
11. 904.32cm^2 , 2147.76cm^3 , ₹226.08
12. i) 404.25cm^3 ii) 89.83cm^3 iii) 24m iv) 38.5m^2