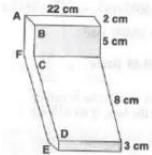


Ch-12 Surface Areas and Volumes

1. An iron pillar has some part in the form of a right circular cylinder and remaining in the form of a right circular cone. The radius of the base of each of cone and cylinder is 8 cm. The cylindrical part is 240 cm high and the conical part in 36 cm high. Find the weight of the pillar if one cu. cm of iron weighs 7.8 grams.
2. An open container made up of a metal sheet is in the form of a frustum of a cone of height 8 cm with radii of its lower and upper ends as 4 cm and 10 cm respectively. Find the cost of oil which can completely fill the container at the rate of Rs. 50 per litre. Also, find the cost of metal used, if it costs Rs. 5 per 100 cm².
3. A building is in the form of a cylinder surmounted by a hemispherical dome. The base diameter of the dome is equal to $\frac{2}{3}$ of the total height of the building. Find the height of the building, if it contains $67\frac{1}{21}$ m³ of air.
4. The diameter of a sphere is 28 cm. Find the cost of painting it all around at Rs. 0.10 per square cm.
5. The perimeter of one face of a wooden cube is 20 cm. Find its weight if 1 cm³ of wood weighs 8.25 g.
6. The radii of two cylinders are in the ratio of $1 : \sqrt{3}$. If the volumes of two cylinders be same, find the ratio of their respective heights.
7. If the radius of the base of a cone is doubled keeping the height same. What is the ratio of the volume of the larger cone to the smaller cone?
8. If the length, breadth and height of a solid cube are in the ratio 4 : 3 : 2 and total surface area is 832 cm². Find its volume.
9. Three cubes of a metal whose edges are in the ratio 3 : 4 : 5 are melted and converted into a single cube whose diagonal is $12\sqrt{3}$ cm. Find the edges of the three cubes.
10. A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 4 cm and diameter of the base is 8 cm. Determine the volume of the toy. If the cube circumscribes the toy, then find the difference of the volumes of the cube and the toy. Also, find the total surface area of the toy.
11. A toy is in the form of a cone mounted on a hemisphere with same radius. The diameter of the base of the conical portion is 7 cm and the total height of the toy is 14.5 cm. Find the volume of the toy.
12. In the figure, the shape of a solid copper piece (made of two pieces) with dimensions as shown. The face ABCDEFA has uniform cross section. Assume that the angles at A, B, C, D, E and F are right angles. Calculate the volume of the piece.
 
13. A toy is in the form of a cone mounted on a hemisphere of common base radius 7 cm. The total height of the toy is 31 cm. Find the total surface area of the toy. [Take $\pi = \frac{22}{7}$].
14. A toy is in the form of a cone mounted on a hemisphere of common base of diameter 7 cm. If the height of the toy is 15.5 cm, find the total surface area of the toy. [Take $\pi = \frac{22}{7}$].

15. A circular tent is cylindrical up to a height of 3 m and conical above it. If the diameter of the base of the cone and cylinder is 105 m and the slant height of the conical part is 53 m, find the total canvas used in making the tent.
16. A solid is composed of a cylinder with hemispherical ends. if the whole length of the solid is 108 cm and the diameter of the hemispherical end is 36 cm, find the cost of polishing its surface at the rate of 70 paise per square cm.
17. A 5 m wide cloth is used to make a conical tent of base diameter 14m and height 24m. Find the cost of cloth used at the rate of Rs. 25 per metre. $\left[\text{Take } \pi = \frac{22}{7} \right]$.
18. A girl empties a cylindrical bucket, full of sand, of base radius 18 cm and height 32 cm, on the floor to form a conical heap of sand. If the height of this conical heap is 24 cm, then find its slant height correct up to one place of decimal.
19. The largest possible sphere is carved out of a wooden solid cube of side 7 cm. Find the volume of the wood left. $\left[\text{Take } \pi = \frac{22}{7} \right]$.
20. 150 spherical marbles, each of radius 1.4 cm, are dropped in a cylindrical vessel of radius 7 cm containing some water, which are completely immersed in water. Find the rise in the level of water in the vessel.
21. If two identical solid cubes of side 'x' are joined end to end, then the total surface area of the resulting cuboid is $12x^2$. Is it true?
22. A spherical ball is melted to make eight new identical balls. Then the radius of each new ball is $\frac{1}{8}$ th of the radius of the original ball. Is it true?
23. A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6 cm. Find the height of the cylinder.
24. The figure shows a decorative block which is made of two solids a cube and a hemisphere. The base of the block is a cube with edge 5 cm and the hemisphere, fixed on the top, has a diameter of 4.2 cm. Find the total surface area of the block. $\left[\text{Take } \pi = \frac{22}{7} \right]$.
25. A bucket is in the form of a frustum of a cone. its depth is 15 cm and the diameters of the top and the bottom are 56 cm and 42 cm respectively. Find how much water can the bucket hold?
26. The height of a cone is 30 cm. A small cone is cut off at the top by a plane parallel to the base. If its volume is $\frac{1}{27}$ th of the volume of the given cone, at what height above the base is the section made?
27. A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface of the remainder is $\frac{8}{9}$ th of the curved surface of the whole cone, find the ratio of the line segments into which the altitude of the cone is divided by the plane.
28. A circus tent is cylindrical to a height of 3 m and conical above it. If its base radius is 52.5 m and slant height of the conical portion is 53 m, find the area of the canvas needed to make the tent.

