SURFACE AREAS AND VOLUMES

CONE, CUBE, SPHERE AND HEMI SPHERE

EXERCISE

- **Q.1** A tent is in the shape of a cylinder surmounted by a conical top. If the height and the diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of Rs 500 per m².
- Q.2 A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm b y 3.5 cm. The radius of each of the depression is 0.5 cm and the depth is 1.4 cm. Find the volume of the wood in the entire stand.



Q.3 A wooden article was made by scooping out a hemisphere from each end of a solid cylinder (as shown in the adjoining figure). If the height of the cyclinder is 10 cm and its base is of radius 3.5 cm, find the total surface area of the article.



- Q.4 (i) A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open , is 5 cm. It is filled with water upto the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped into the vessel.
 - (ii) A vessel is in the form of an inverted cone. Its height is 11 cm and the radius of its top, which is open, is 2.5 cm. It is filled with water upto the rim. When some lead shots, each of which is a sphere of radius 0.25 cm, are dropped into the vessel of the water flows out. Find the number of lead shots dropped into the vessel.
- **Q.5** A hemispherecal depression is cut out from one face of a cuboidal block such that the diameter *I*(cm) of the hemisphere is equal to the edge of the cube. Find the volume and the surface area of the remaining solid.
- **Q.6** A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.
- Q.7 A student was asked to make a model shaped like a cylinder with two cones attached at its ends by using a thin aluminium sheet. The diameter of the model is 3

cm and its length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model.

- **Q.8** The internal and external diameters of a hollow hemispherical vessel are 14cm and 21cm respectively. The cost of silver plating of 1 cm² surface is Rs 0.60. Find the total cost of silver plating the vessel all over.
- **Q.9** A solid is in the shape of a cone surmounted on a hemisphere with both their radii being equal to 1 cm and the height of the cone is equal to its radius. Find the volume of the solid. (Leave your answer in p)
- Q.10 The adjoining figure shows a playing top (*lattu*). The top is shaped like a cone surmounted by a hemisphere. The entire top is 5 cm in height and the diameter of the top is 3.5 cm. Find its surface area.



ANSWER KEY

- **1.** 44 m² , Rs 22000
- **2.** 523.53 cm³
- **3.** 374 cm²
- **4.** (i) 100 (ii) 440
- 5. $(12-p) \text{ cm}^3$; $(p + 24) \text{ cm}^2$
- **6.** 572 cm²
- **7.** 66 cm³
- 8. Rs. 716.10
- **9.** p cm³
- **10.** 39.6 cm² (approx)