EDUCATION DEPARTMENT, VILLUPURAM DISTRICT.

UNIT TEST Class : X Marks: 50 **UNIT 7 - Mensuration** Subject: Mathematics Time: 1½ hrs. Т Choose the correct answer. 7×1=7 If two solid hemispheres of same base radius r units are joined together along their bases, then curved 1. surface area of this new solid is c) $3\pi r^2$ sq. units a) $4\pi r^2$ sq. units b) $6\pi r^2$ sq. units d) $8\pi r^2$ sq. units 2. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be b) 10 cm a) 12 cm c) 13 cm d) 5 cm 3. If the radius of the base of a cone is tripled and the height is doubled then the volume is a) made 6 times b) made 18 times c) made 12 times d) unchanged The total surface area of a hemi-sphere is how much times the square of its radius. 4. b) 4π c) 3π d) 2π a) π A frustum of a right circular cone is of height 16cm with radii of its ends as 8cm and 20cm. Then, the 5. volume of the frustum is a) 3328π cm³ c) 3240π cm³ d) 3340π cm³ b) 3228π cm³ A spherical ball of radius r₁ units is melted to make 8 new identical balls each of radius r² units. Then 6. $r_1 : r_2$ is a) 2 : 1 b) 1 : 2 c) 4 : 1 d) 1:4 7. The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is a) 1 : 2 : 3 b) 2 : 1 : 3 c) 1 : 3 : 2 d) 3 : 1 : 2 Answer the following questions. (any 5) 5×2=10 The curved surface area of a right circular cylinder of height 14 cm is 88 cm². Find the diameter of the 1. cylinder. 2. If the total surface area of a cone of radius 7 cm is 704 cm^2 , then find its slant height. If the base area of a hemispherical solid is 1386 sq. metres, then find its total surface area? 3. If the ratio of radii of two spheres is 4 : 7, find the ratio of their volumes. 4. 5. A cone of height 24 cm is made up of modeling clay. A child reshapes it in the form of a cylinder of same radius as cone. Find the height of the cylinder. An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the 6. cylinder.

7. The slant height of a frustum of a cone is 5 cm and the radii of its ends are 4 cm and 1 cm. Find its curved surface area.

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III Answer the following questions. (any 5)

- 1. An industrial metallic bucket is in the shape of the frustum of a right circular cone whose top and bottom diameters are 10 m and 4 m and whose height is 4 m. Find the curved and total surface area of the bucket.
- 2. From a solid cylinder whose height is 2.4 cm and the diameter 1.4 cm, a cone of the same height and same diameter is carved out. Find the volume of the remaining solid to the nearest cm³.
- As shown in figure a cubical block of side 7 cm 3. is surmounted by a hemisphere. Find the surface area of the solid.
- 4. A right circular cylindrical container of base radius 6 cm and height 15 cm is full of ice cream. The ice cream is to be filled in cones of height 9 cm and base radius 3 cm, having a hemispherical cap. Find the number of cones needed to empty the container.
- 5. A toy is in the shape of a cylinder surmounted by a hemisphere. The height of the toy is 25 cm. Find the total surface area of the toy if its common diameter is 12 cm.
- 6. A solid right circular cone of diameter 14 cm and height 8 cm is melted to form a hollow sphere. If the external diameter of the sphere is 10 cm, find the internal diameter.
- As observed from the top of a 60 m high lighthouse from the sea level, the angles of depression of two ships 7. are 28° and 45°. If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships. $(\tan 28^\circ = 0.5317)$

IV Answer the following question.

Nishanth is the winner in a Marathon race of 12 km distance. He ran at the uniform speed of 12 km/hr 1. a) and reached the destination in 1 hour. He was followed by Aradhana, Ponmozhi, Jeyanth, Sathya and Swetha with their respective speed of 6 km/hr, 4 km/hr, 3 km/hr and 2 km/hr. And, they covered the distance in 2 hrs, 3 hrs, 4 hrs and 6 hours respectively. Draw the speed-time graph and use it to find the time taken to Kaushik with his speed of 2.4 km/hr.

(OR)

Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$ b)



 $5 \times 5 = 25$

1×8=8