SURFACE AREA AND VOLUMES

Match the following:

Surface area of sphere	$2\pi rh$
Total surface area of cone	$\frac{1}{3}\pi r^2 h$
Volume of Cuboid	$2\pi r(h + r)$
Volume of hemisphere	$\frac{1}{3}\pi h(r^2 + R^2 + r R)$
Curved Surface area of cone	$\pi r (l + r)$
T.S.A of hemisphere	lbh
C.S.A of Cylinder	$2/3\ \pi r^3$
Volume of cone	πrl
T.S.A of Cylinder	$3\pi r^2$
Volume of Frustum	$4\pi r^2$

Fill in the blanks:

1) The T.S.A of cuboid of dimensions $a \times a \times b$ is _____
2) The volume of cylinder with base radius r and height 2r is _____
3) The T.S.A of cylinder with radius r and height h is _____
4) The CS.A of cone with radius r and height h is _____
5) If the height of the cone is equal to the diameter of the base, the volume is _____
6) The T.S.A of a hemisphere of radius r is _____
7) The lateral surface area of a hollow cylinder with outer radius R, inner radius r and height h is _____
8) C.S.A of frustum is _____
9) If the radius of sphere is doubled , then the volume becomes _____ times the original sphere.
10) If the radius of sphere is halved , then the volume becomes _____ times the original sphere.

Short and long answers:

1) A cone of radius 10 cm is divided in to two parts by drawing a plane through the midpoint of the axis parallel to the base. Compare the volumes of two parts.
2) A farmer connects a pipe of diameter 20 cm to a cylindrical tank in her field which is 10m in diameter and 2m deep. If the water flows at thye rate of 3Km/ hr, how much time will it take to fill the tank?
3) A toy is in the form of a cone on hemisphere of diameter 7 cm. The total height of the toy is 14.5 cm. Find the volume of the toy.
4) A vessel in the form of hemispherical is surmounted by a cylinder. The diameter of the bowl is 14cm and the total height is 13cm. Find the capacity of the vessel.

5) A cylindrical container with radius 6 cm and height 15 cm is filled with ice cream and ice cream is distributed to 10 children in equal cones having hemispherical tops. If the height of the conical portion is 4 times the radius of the base, find the radius of the base of the cone.
6) A tent is cylindrical surmounted by a conical roof. The radius of the cylindrical base is 20m. The total height of the tent is 6.3m and the height of cylindrical portion is 4.2m. Find the volume and surface area of the tent.
7) A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the vessel is 14cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.
8) A conical vessel with internal radius 6 cm and height 8 cm is completely filled with water. A sphere is lowered in to the water and its size is such that when it touches the sides it is just immersed. Find the volume of the water overflows.
9) How many silver coins 1.75cm in diameter and 2mm thickness must be melted to form a cuboid of dimensions 5.5cm × 10cm × 3.5 cm?
10) A wooden article was made by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 10cm and its base radius is 3.5 cm find the total surface area of the solid.
11) A sphere of radius 3cm is dropped in a cylindrical vessel partly filled with water. The radius of vessel is 6cm.If the sphere is submerged completely, by how much will the surface of the water be raised?
12) The radii of the ends of a frustum of a cone are 14cm and 21cm and slant height is 8 cm Find the C.S.A.
13) Find the volume of frustum of an cone whose radii are 7m and 4m and height is 4m.
14) A lamp shade is in the form of a frustum of a cone open at both ends. The radii of its ends are 16cm and 24cm and its height is 6cm. Find the cost of paper used if one sq.c m costs Rs 0.70.
15) A solid sphere of radius 6cm is melted to form a hollow cylinder of uniform thickness. If the external radius of the cylinder is 5cm and its height is 32cm, find the uniform thickness of the cylinder.

MCQ:

1) The total surface area of the solid hemisphere of radius r is

   a) Πr^2 b) $2\Pi r^2$ c) $3\Pi r^2$ d) $4\Pi r^2$

2) The volume and surface area of sphere are numerically equal. The radius is

   a) 0 units b) 1 units c) 2 units d) 3 units

3) A cylinder, a cone and a hemisphere have same base radius and height. The ratio of their volumes is

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

4) Small spheres of radius 2 cm are made by melting an iron ball of radius 6cm, then the number of small spheres is

   a) 9 b) 6 c) 27 d) 81

5) A solid sphere of radius r cm is melted to recast in to a cone of height r. The base radius of the cone

   a) 2r b) r c) 3r d) 4r

6) Three solid spheres of radius 6cm, 8cm, 10cm are melted to form a single solid sphere. The radius of the new sphere is

   a) 6cm b) 4.5cm c) 3cm d) 12cm

7) The radii of the ends of a frustum of a cone 40cm high are 38cm and 8 cm. The slant height of the frustum is

   a) 50cm b) $10\sqrt{7}$ cm c) 60.96cm d) $4\sqrt{2}$ cm

The volume of the largest right circular cone that can be cut out from a cube of edge 4.2 cm is :

(A) 9.7 cm^3 (B) 77.6 cm^3 (C) 58.2 cm^3 (D) 19.4 cm^3

The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is.

(A) 60 π cm^2 (B) 68 π cm^2 (C) 120 π cm^2 (D) 136 π cm^2

The volume of a sphere (in cu. cm) is equal to its surface area (in sq. cm). The diameter of the sphere (in cm) is :

(A) 3 (B) 6 (C) 2 (D) 4

If the radii of circular ends of frustum of a cone are 20 cm and 12 cm and its height is 6 cm, then the slant, height of frustum (in cm) is :

(A) 10 (B) 8 (C) 12 (D) 15

If the radius of base of a cylinder is doubled and the height remains unchanged, its curved surface area becomes.

(A) double (B) three times (C) half (D) no change

If the surface area of a sphere is 144 π cm^2, then its radius is :

(A) 6 cm (B) 8 cm (C) 12 cm (D) 10 cm

The total surface area of a solid hemisphere of radius 7 cm is :

(A) 447π cm^2 (B) 239π cm^2 (C) 147π cm^2 (D) 174π cm^2

A solid sphere of radius r is melted and recast into the shape of a solid cone of height r, then the radius of the base of the cone is :

(A) r (B) 2r (C) r^2 (D) $\frac{r}{2}$

If a solid right circular cone of height 24 cm and base radius 6 cm is melted and recast in the shape of a sphere, then the radius of the sphere is

(A) 6 cm (B) 4 cm (C) 8 cm (D) 12 cm

The ratio of volume of a cone and a cylinder of equal diameter and equal height is

(A) 3 : 1 (B) 1 : 3 (C) 1 : 2 (D) 2 : 1

A metallic cube of edge 1 cm is drawn into a wire of diameter 4mm, then the length of the wire is

(A) $100/\pi$ cm (B) 100π cm (C) $25/\pi$ cm (D) 10000 cm

The number of cubes of side 2 cm which can be cut from a cube of side 6 cm is :

(A) 56 (B) 54 (C) 28 (D) 27

A solid sphere of radius x cm is melted and cast into a shape of a solid cone of radius x cm. Then the height of the cone is :

(A) $3x$ cm (B) x cm (C) $4x$ cm (D) $2x$ cm

A shuttle cock used for playing badminton has the shape of the combination of :

(A) a cylinder and a sphere (B) a sphere and a cone

(C) a cylinder and a hemisphere (D) a hemisphere and frustum cone

If a cone is cut into two parts by a horizontal plane passing through the mid-points of its axis, the ratio of the volumes of the upper part and the cone is

(A) 1 : 2 (B) 1 : 4 (C) 1 : 6 (D) 1 : 8