

CLASS X – MATHEMATICS – CHAPTER 12

SURFACE AREA AND VOLUME

Name:

Date:

CHOOSE THE CORRECT OPTION FROM QUES 1 TO 15

- Q01.** The number of solid spheres each of diameter 6cm that could be moulded to form a solid metal cylinder of height 45cm and diameter 4cm is
(a) 3 (b) 4 (c) 5 (d) 6
- Q02.** A metallic sphere of radius 10.5 cm is melted and then recast into small cones each of radius 3.5 cm and height 3cm the number of such cone is
(a) 63 (b) 126 (c) 21 (d) 130
- Q03.** A circular test is cylindrical to a height of 4cm and conical above it. If its diameter is 105 m and its slant height is 40m, then the total area of canvas required is
(a) 1760 m² (b) 2640 m² (c) 3960 m² (d) 7920 m²
- Q04.** The diameter of a sphere is 6cm. It is melted and drawn into a wire of diameter 2cm. The length of the wire is
(a) 12cm (b) 18cm (c) 36cm (d) 66cm
- Q05.** The ratio between the volumes of two spheres is 8 : 27. What is the ratio between their surface areas?
(a) 2 : 3 (b) 4 : 5 (c) 5 : 6 (d) 4 : 9
- Q06.** A solid sphere of radius r is melted and cast into the shape of a solid cone of height r, the radius of the base of the cone is
(a) 2r (b) 3r (c) r (d) 4r
- Q07.** During conversion of a solid from one shape to another, the volume of new shape will
(a) increase (b) decrease (c) remain unaltered (d) be doubled
- Q08.** A right circular cylinder of radius r cm and height h cm ($h > 2r$) just encloses a sphere of diameter
(a) r cm (b) 2r cm (c) h cm (d) 2h cm
- Q09.** A solid is hemispherical at the bottom and conical above. If the surface areas of the two parts are equal, then the ratio of its radius and the height of its conical part is
(a) 1:3 (b) 1: 3 (c) 1:1 (d) 3 :1

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- Q10.** A reservoir is in the shape of a frustum of a right circular cone. It is 8m across at the top and 4m across at the bottom. If it is 6m deep, then its capacity is
(a) 176 m^3 (b) 196 m^3 (c) 200 m^3 (d) 110 m^3
- Q11.** A cone of height 24 cm and radius of base 6 cm is made up of modelling clay. A child reshapes it in the form of a sphere the radius of the sphere is.
(a) 5cm (b) 6cm (c) 8cm (d) 12cm
- Q12.** A circular tent is cylindrical to a height of 4m and conical above it. If its diameter is 210m and its slant height is 40m. The total area of the canvas required in m^2 is
(a) 1760 (b) 15840 (c) 3960 (d) 7960
- Q13.** A solid is hemispherical at the bottom and conical above. If the surface areas of the two parts are equal, then the ratio of its radius and the height of its conical part is
(a) 1:3 (b) 1: $\sqrt{3}$ (c) 1:1 (d) $\sqrt{3}$:1
- Q14.** If the radii of the circular ends of a bucket of height 40cm are of length 35cm and 14cm, then volume of the bucket in cubic centimeter is
(a) 60060 (b) 80080 (c) 70040 (d) 80760
- Q15.** A hollow cube of internal edge 22cm is filled with spherical marbles of diameter 0.5cm and it is assumed that $\frac{1}{8}$ space of the cube remains unfilled. Then the number of marbles that the cube can accommodate is
(a) 142296 (b) 142396 (c) 142496 (d) 142596
- Q01.** A 20m deep well with diameter 7m is dug up and the earth from digging is evenly spread out to form a platform $22\text{m} \times 14\text{m}$ Find the height of the platform.
- Q02.** Find the maximum volume of a cone that can be carved out of solid hemisphere of radius r.
- Q03.** Find the volume of the largest right circular cone that can be cut out of the cube whose edge is 7 cm
- Q04.** A hollow cylindrical pipe is 420cm long. It's outer and inner diameter are 8 cm and 6cm respectively. Find the volume of the copper used in making the pipe.
- Q05.** A plate of metal 1 cm thick, 9 cm broad and 81cm long is melted into a cube. Find the difference in the surface area of the two solids.

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- Q06.** The difference between outside and inside surfaces of a cylindrical metallic pipe 14cm long is 44 cm^2 . If the pipe is made of 99 cm^3 of metal. Find the outer and inner radii of the pipe.
- Q07.** A toy is in the form of a cone mounted on a hemisphere of common base radius 7cm. The total height of the toy is 31cm. find the total surface area of the toy.
- Q08.** The radius of a solid iron sphere is 8cm. eight rings of iron plate of external radius $\frac{20}{3} \text{ cm}$ and thickness 3cm are made by melting this sphere. Find internal radius of this rings.
- Q09.** Determine the ratio of the volume of a cube to that of a sphere which with exactly fit inside the cube
- Q10.** Find the max. volume of a cone that can be carved out of a solid hemisphere of radius r .
- Q11.** The height of a cone is 12 cm and the radius of its base is 4.5 cm. Find slant height.
- Q12.** The diameter of metallic sphere is 6cm. the sphere is melted and drawn into a wire of uniform cross section. If the length of wire is 36cm. Find its radius.
- Q13.** Water flows at the rate of 10 metre per minute through a cylindrical pipe having its diameter at 5mm. How much time will it take to fill a conical vessel where diameter of base is 40 cm and depth 24 cm?
- Q14.** The radius of the base and the height of solid right cylinder are in the ratio 2:3 and its volume is 1617 cu.cm . Find the total surface area of the cylinder.
- Q15.** A toy is in form of a cone mounted on a hemisphere of common base radius 7cm. The total height of the toy is 31 cm find the total surface area of the toy.
- Q16.** The diameter of a sphere is 6cm. It is melted and drawn into a wire of diameter 2cm. what is the length of wire.
- Q17.** An iron pipe 20cm long has exterior diameter equal to 25cm. If the thickness of the pipe is 1cm. Find the whole surface area of the pipe.
- Q18.** Find the ratio of the volumes of two circular cones. If $r_1 : r_2 = 3 : 5$ and $h_1 : h_2 = 2 : 1$.
- Q19.** A well 3.5m in diameter and 20m deep into be dug in rectangular field 20m by 14m. The earth taken out is spread evenly on the field. Find the level of the earth raised in the field.
- Q20.** A solid sphere of radius 6cm is melted into a hollow cylinder of uniform thickness. If the external radius of the base of cylinder is 5cm and its height is 32cm, Find the uniform thickness of the cylinder.

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- Q21.** A medicine capsule is in the shape of a cylinder with two hemispheres. Stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.
- Q22.** 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 $15\text{cm} \times 10\text{cm} \times 3.5\text{cm}$. The radius of each of the depressions is 0.5cm and the depth is 1.4cm. Find the volume of the wood in the entire stand.
- Q23.** A solid iron pole consists of a cylinder of height 110 cm and of base diameter 24cm. Which is surmounted by a cone 9cm high, find the mass of pole. Given that 1cm^3 of iron has 8g mass approx.
- Q24.** If 2 cubes each of volume 64cm^3 are joined end to end. Find the surface area of the resulting cuboid.
- Q25.** Kuldeep made a bird bath for his garden in the shape of a cylinder with a hemispherical depression at one end. The height of the cylinder is 1.45m and its radius is 30cm. Find the total surface area of the bird-bath.
- Q26.** A vessel is in the form of an inverted cone. Its height is 8cm and radius of its top, which is open, is 5cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5cm, are dropped into the vessel. One fourth of the water flows out. Find the number of lead shots dropped.
- Q27.** A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.
- Q28.** A spherical glass vessel has a cylindrical neck 8cm long, 2cm in diameter, the diameter of the spherical part 8.5 cm. By measuring the amount of water it holds, a child finds its volume to be 345cm^3 . Check whether she is correct, taking the above as the side measurements.
- Q29.** Metallic spheres of radii 6cm, 8cm and 10cm respectively are melted to form a single solid sphere. Find the radius of the resulting sphere.
- Q30.** A solid cylinder of diameter 12cm and height 15cm is melted and recast into toys with the shape of a right circular cone mounted on a hemisphere of radius 3cm. If the height of the cone is 12cm find the number of toys so formed.

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- Q31.** A farmer connects a pipe of internal diameter 20cm from a canal into a cylindrical tank in his field which is 10m in diameter and 2m deep. If water flows through the pipe at the rate of 3 km/h in how much time will the tank be filled?
- Q32.** A cone of height 24 cm and radius of base 6 cm is made up of modelling clay. Find the volume of the cone.
- Q33.** A cone of radius 10cm divided into two parts by drawing a plane through the midpoint of its axis, parallel to its base. Compare the volume of the two parts.
- Q34.** A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14cm and the total height of the Vessel is 13cm. find inner surface Area?
- Q35.** A spherical ball of diameter 21 cm is melted and recanted into cubes each of side 1cm. find the no. of cubes thus formed
- Q36.** How many silver coins 1.75cm in diameter and of thickness 2mm must be melted to form a cuboid $5.5\text{cm} \times 10\text{cm} \times 3.5\text{cm}$?
- Q37.** A container like a right circular having diameter 12cm and height 15cm is full of ice-cream. The ice-cream is to be filled in cones of height 12cm and diameter 6cm having a hemispherical shape on the top. Find number of such cones which can be filled with ice-cream.
- Q38.** Water flowing at the rate of 15 km per hour through a pipe of diameter 14cm into a rectangular tank which is 50m long and 44m wide. Find the time in which the water level in the tank will rise by 21cm.