Topper's Secret Questions

Surface Area & Volume

1. The total surface area of a 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 the surface area of a sphere are numerically equal, then the radius of sphere is

(A) $0\ units$ (B) $1\ unit$ (C) $2\ units$ (D) $3\ units$

3. A cylinder, a cone and a hemisphere are of the same base and of the same height. The ratio of their volumes is

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

4. Volume of two spheres is in the ratio 64 : 125. Find the ratio of their surface areas.

5. A cylinder and a cone are of same base radius and of same height. Find the ratio of the volumes of cylinder to that of the cone.

6. If the volume of a cube is 1331 cm^3, then find the length of its edge.

7. Two cones have their heights in the ratio 1 : 3 and radii in the ratio 3 : 1. What is the ratio of their volumes?

8. Find the height of largest right circular cone that can be cut out of a cube whose volume is 729 cm^3.

9. Two identical cubes each of volume 216 cm^3 are joined together end to end. What is the surface area of the resulting cuboid?

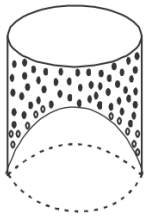
10. The volume of a right circular cylinder with its height equal to the radius is $25\frac{1}{7}$ cm^3. Find the height of the cylinder. Use $\pi = \frac{22}{7}$.

11. Find the depth of a cylindrical tank of radius 10.5 cm, if its capacity is equal to that of a rectangular tank of size 15 cm × 11 cm × 10.5 cm.

12. A petrol tank is a cylinder of base diameter 28 cm and length 24 cm filted with conical ends each of axis length 9 cm. Determine the capacity of the tank.

13. A solid is in the form of a cylinder with hemispherical ends. The total height of the solid is 20 cm and the diameter of the cylinder is 7 cm. Find the total volume of the solid. Use $\pi = \frac{22}{7}$

14. A juice seller was serving his customers using glasses as shown in figure. The inner diameter of the cylindrical glass was 5 cm but bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm, find the apparent and actual capacity of the glass. [Use $\pi = 3.14$]

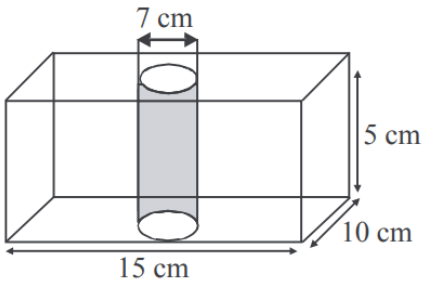


15. A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the pole, given that 1 cm^3 of iron has approximately 8 gm mass. (Use π= 3.14)

16. A right cylindrical container of radius 6 cm and height 15 cm is full of ice-cream, which has to be distributed to 10 children in equal cones having hemispherical shape on the top. If the height of the conical portion is four times its base radius, find the radius of the ice-cream cone.

17. A solid wooden toy is in the form of a hemi-sphere surmounted by a cone of same radius. The radius of hemi-sphere is 3.5 cm and the total wood used in the making of toy is $166\frac{5}{6}$ cm^3 Find the height of the toy. Also, find the cost of painting the hemi-spherical part of the toy at the rate of rs. 10 per cm^2. Use $\pi = \frac{22}{7}$

18. In the given figure, from a cuboidal solid metalic block of dimensions 15 cm × 10 cm × 5 cm a cylindrical hole of diameter 7 cm is drilled out. Find the surface area of the remaining block. [Use $\pi = \frac{22}{7}$].



19. A tent is in the shape of a right circular cylinder up to a height of 3 m and conical above it. The total height of the tent is 13.5 m and radius of base is 14 m. Find the cost of cloth required to make the tent at the rate of 80 per m^2.

20. The rain water from a roof 22 m × 20 m drains into a cylindrical vessel having diameter of base 2 m and height 3.5 m. If the vessel is just full, find the rainfall in cm.

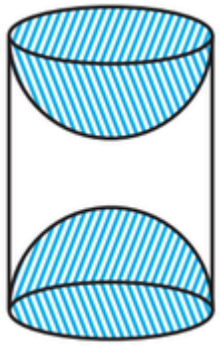
21. The difference between outer and inner curved surface areas of a hollow right circular cylinder, 14 cm long is 88 cm^2. If the volume of the metal used in making the cylinder is 176 cm^3. Find the outer and inner diameters of the cylinder.

22. A hemispherical depression is cut out from one face of a cubical wooden block of edge 21 cm, such that the diameter of the hemisphere is equal to edge of the cube. Determine the volume of the remaining block.

23. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

24. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2.

25. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in Fig. 12.11. If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the total surface area of the article.



26. 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 up to 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 in the vessel.

27. A cone of maximum size is carved out from a cube of edge 14 cm. Find the surface area of the cone and of the remaining solid left out after the cone carved out.

28. A factory manufactures 120000 pencils daily. The pencils are cylindrical in shape each of length 25 cm and circumference of base as 1.5 cm. Determine the cost of coloring the curved surfaces of the pencils manufactured in one day at Rs 0.05 per dm^2.

29. A rocket is in the form of a right circular cylinder closed at the lower end and surmounted by a cone with the same radius as that of the cylinder. The diameter and height of the cylinder are 6 cm and 12 cm, respectively. If the slant height of the conical portion is 5 cm, find the total surface area and volume of the rocket.

[use $\pi = 3.14$]

30. A pen stand made of wood is in the shape of a cuboid with four conical depressions and a cubical depression to hold the pens and pins, respectively. The dimension of the cuboid are 10 cm, 5 cm and 4 cm. The radius of each of the conical depressions is 0.5 cm and the depth is 2.1 cm. The edge of the cubical depression is 3 cm. Find the volume of the wood in the entire stand.

ANSWER'S

Q1. C
Q2. D
Q3. C
Q4. 16:25
Q5. 3:1
Q6. 11 cm
Q7. 3:1
Q8. 9 cm
Q9. 360 cm^2
Q10. 2 cm
Q11. 5 cm
Q12. 18480 cm^2
Q13. $680\frac{1}{6}$ cm^3
Q14. 196.25 cm^3, 163.54 cm^3
Q15. 892.2624 kg
Q16. 3 cm
Q17. 6 cm, 770 rs
Q18. 583 cm^3
Q19. 82720 rs
Q20. $2.5\ cm$
Q21.5 cm & 3 cm
Q22. 6835.5 cm^3
Q23. 7 cm, 332.5 cm^2
Q24. 18 cm^2
Q25. 374 cm^2
Q26. 100
Q27. $154(\sqrt{5}+1)$ cm^2, $(1022+154\sqrt{5})$ cm^2
Q28. 2250
Q29. 301.44 cm^2, 377.1 cm^3
Q30. 170.8 cm^3