CBSE Class 10 Maths Chapter 13 Important Questions and Answers: Surface Areas and Volumes

MULTIPLE CHOICE QUESTIONS (1 MARK)

Q1. The ratio of the total surface area of a solid hemisphere to the square of its radius is

a) 2π : 1

b) 3 π: 1

c) 4 π : 1

d) 1: 4 π

Q2. The circumference of the edge of a hemispherical bowl is 132 cm. When π is taken as

the capacity of the bowl in cm^3 is :

a) 2772

b) 924

c) 19404

d) 9702

Q3. The radius of a wire is decreased to one third. If the volume remains the same, the length will

become

a) 3 times

b) 6 times

c) 9 times

d) 27 times

Q4. The surface area of the two spheres are in the ratio 1 : 2. The ratio of their volumes is :

a) √2: 1

b) 1 : 2√2

c) 1 : 8

d) 1 : 4

Q5. The radius of a sphere is r cm. The sphere is divided into two equal parts. The whole surface area of two parts will be:

a) $8\pi r^2$

b) $6\pi r^2$

c) $4\pi r^2$

d) $3\pi r^2$

Q6. If the areas of three adjacent faces of a cuboid are X, Y and Z respectively, then the volume of cuboid is :

a) XYZ

b) 2XYZ

c) $\sqrt{XYZ}$

d) $\sqrt{2XYZ}$

Q7. Two cubes each of volume $8cm^3$ are joined end to end , then the surface area of the resulting cuboid is

a) 80 cm^2

b) 64 cm^2

c) 40 cm^2

d) 8 cm^2

Q8. If the radius of the base of a right circular cylinder is halved, keeping the height same, the

ratio of the volume of the reduced cylinder to that of original cylinder is

a) 2 : 3

b) 3 : 4

c) 1 : 4

d) 4 : 1

Q9. The radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. Ratio of their volumes is

a) 27 : 20

b) 20 : 27

c) 9: 4

d) 4 : 9

Q10.The ratio of the volumes of two spheres is 8 : 27 . If r and R are the radii of spheres respectively then (R – r) : r is :

a) 1 : 2

b) 1 : 3

c) 2 : 3

d) 4 : 9

OBJECTIVE TYPE QUESTIONS

Q1. The surface area of a sphere is the same as the curved surface area of a right circular cylinder whose height and diameter are 12 cm each. Find the radius of the sphere.

Q2. Find the Total Surface Area of a hemispherical solid having radius 7 cm.

Q3. The volume of two cubes are in the ratio 8 : 64 , then find the ratio of their surface areas.

Q4. Find the volume of a right circular cylinder of base radius 7 cm and height 10 cm

Q5. Find the curved surface area of a right circular cone of height 15 cm and base diameter 16 cm.

Q6. If h, c and V respectively are the height, curved surface area and volume of a cone then find $3\pi Vh^3 - c^2h^2 + 9V^2$ = ...

Q7. Find the volume of the greatest sphere that can be cut from a cylindrical log of wood of base radius 1 cm and height 5 cm.

Q8. A cone and a hemisphere have equal bases and equal volumes. What is the ratio of their heights?

Q9. How many bags of grain can be stored in a cubic granary 12m x 6m x 5m , if each bag occupies a space of 0.48 m^3?

Q10. A cylinder and a cone are of the same base radius and of same height. What is the ratio of their volumes?

1	6 cm
2	462
3	4:9 cm^3
4	1540 cm^3
5	136π
6	0
7	(4/3)π

8	2:1
9	750
10	3:1

SHORT ANSWER TYPE QUESTIONS – 2 MARKS

Q1. Two cubes each of volume $27cm^3$ are joined end to end to form a solid. Find the surface area of the solid.

Q2. Fifty circular plates each of radius 7cm and thickness 0.5cm are placed one above another to form a solid right circular cylinder. Find its TSA.

Q3. Two cubes of each side 4cm are joined end to end. Find the volume of the resulting solid.

Q4. A conical vessel whose inner radius is 10 cm and height 48cm is full of water. Find the

volume of water in it.

Q5. Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 9cm.

Q6. A circus tent is cylindrical up to a height of 3m and conical above it. If the diameter of the base is 105m and the slant height of the conical part is 53cm, find the total canvas required in making the tent.

1	$90cm^2$
2	$1408cm^2$
3	$128cm^3$
4	$5024cm^2$
5	$190.93cm^3$
6	$9735m^2$

SHORT ANSWER TYPE QUESTIONS – 3 MARKS

Q1. A toy is in the form of a cone mounted on a hemisphere of same radius 7 cm. If the total height of the toy is 31 cm, find its total surface area.

Q2. A rocket is in the form of a cylinder, closed at the lower end, has a cone attached to its top. If each one has a radius 20 cm and height 21 cm, find the surface area of the rocket.

Q3. An ice - cream cone consists of a cone surmounted by a hemisphere. The radius of the hemisphere is 3.5 cm and height of the ice - cream cone is 12.5 cm. Calculate the volume of the ice – cream in the cone.

Q4. A cone of maximum size is carved out from a cube of edge 14 cm. Find the surface area of the solid left out after the cone is carved out.

Q5. A semi-circular sheet of paper of diameter 28 cm is bent into an open conical cup. Find the depth and capacity of the cup.

Q6. The largest possible cylinder is cut out from a wooden cube of 8 cm. Find the volume of wood remaining in the cube.

1	858 cm^2
2	5720 cm^2
3	205.33 cm^3
4	1365.2 cm^2
5	718 2/3 cm^2
6	109.8 cm^3

LONG ANSWER QUESTIONS (4 MARKS)

Q1. A solid is in the shape of a cone mounted on a hemisphere of same base radius. If the curved surface areas of the hemispherical part and the conical part are equal, then find the ratio of the radius and the height of the conical part.

Q2. The sum of the radius of the base and height of a solid right circular cylinder is 37cm. if the total surface area of the solid cylinder is 1628 sq.cm, find the volume of the cylinder. ($\pi = 22/7$).

Q3. A hollow cylindrical pipe is made up of copper. It is 21 dm long. The outer and inner diameters of the pipe are 10cm and 6cm respectively. Find the volume of copper used in making the pipe ($\pi = 22/7$)

Q4. A metallic cylinder has radius 3cm and height 5cm. To reduce its weight, a conical hole is drilled in the cylinder. The conical hole is drilled in the cylinder. The conical hole has a radius of 3/2 cm. and its depth is 8/9cm. Calculate the ratio of the volume of metal left in the cylinder to the volume of metal taken out in the conical shape.

1	1:√3
2	4620 cub.cm
3	10560cub.cm
4	133: 2