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Chapter-13 Surface area and volume



Short Question + Long Question

Q. 1. The curved surface area of a cylinder is 264 m^2 and its volume is 924 m^3 . Find the ratio of its height to its diameter. [CBSE 2014]

Sol. Let the radius and height of a cylinder be r and h , respectively.

Given, curved surface area of a cylinder = 264 m^2

$$2\pi rh = 264 \quad \dots(1)$$

and volume of a cylinder = 924 m^3

$$\pi r^2 h = 924 \quad \dots(2)$$

On dividing eq. (2) by eq. (1), we get

$$\frac{\pi r^2 h}{2\pi rh} = \frac{924}{264}$$

$$\Rightarrow \frac{r}{2} = \frac{924}{264}$$

$$\Rightarrow r = \frac{924 \times 2}{264} = 7 \text{ m}$$

On putting $r = 7$ in eq. (1), we get

$$2\pi(7) \times h = 264$$

$$\Rightarrow 2 \times \frac{22}{7} \times 7 \times h = 264$$

$$\Rightarrow h = \frac{264}{44} = 6 \text{ m}$$

∴ Ratio of height and diameter

$$= \frac{h}{2r} = \frac{6}{2 \times 7} = \frac{3}{7} \text{ or } 3:7.$$

Q. 4. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in his field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/hr , in how much time will the tank be filled? [NCERT; CBSE 2012, 14]

Sol. Radius of pipe = $\frac{10}{100} = 0.10 \text{ m}$

∴ Radius of cylinder = 5 m

$$h = 2 \text{ m}$$

$$\text{Volume of cylinder} = \pi r^2 h = \pi \times 5 \times 5 \times 2 = 50\pi \text{ cm}^3$$

Volume of water in pipe = $\pi r^2 h$

$$\pi \times (0.10)^2 \times h = 50\pi$$

$$h = \frac{50}{0.10 \times 0.10} = 5000 \text{ m}$$

Now, 3000 m water flows in 60 minutes

$$\therefore 1 \text{ m water flows} = \frac{60}{3000}$$

$$\therefore 5000 \text{ m water flows} = \frac{60}{3000} \times 5000 = 100 \text{ minutes}$$

Q. 10. Find the volume of the largest sphere that can be cut from cylindrical log of wood of base radius 1 m and height 4 cm .

[CBSE 2011]

Sol. The largest sphere of radius 1 m can be cut from cylindrical log of wood of base 1 m and height 4 m

$$\therefore \text{Volume of sphere} = \frac{4}{3}\pi(1)^3 \text{ m}^3 = \frac{4}{3}\pi \text{ m}^3$$

Q. 3. Find the volume of the largest right circular cone that can be cut out from a cube of edge 4.2 cm . [NCERT Exemplar; CBSE 2012]

Sol. Since, the largest right circular cone can be cut out from a cube of edge 4.2 cm .

$$\therefore \text{Height of the cone} = \text{Edge of the cube} = 4.2 \text{ cm}$$

and diameter of the cone = Edge of cube

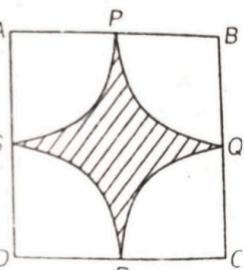
$$= 4.2 \text{ cm}$$

⇒ Radius of cone = 2.1 cm

$$\therefore \text{Volume of cone} = \frac{1}{3}\pi r^2 h$$

$$= \frac{1}{3} \times \frac{22}{7} \times 2.1 \times 2.1 \times 4.2 = 19.4 \text{ cm}^3$$

Q. 3. Find the area of the shaded region in fig. where arcs drawn with centres A, B, C and D intersect in pairs at mid-points P, Q, R and S of the sides AB, BC, CD and DA respectively of square of side 12 cm .



[CBSE 2018]

Sol. Given that $ABCD$ is a square and P, Q, R and S are the mid-points of AB, BC, CD and DA respectively.

$$AB = 12 \text{ m}$$

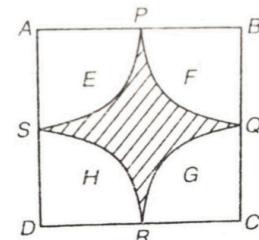
$$\Rightarrow AP = 6 \text{ m} \quad \{P \text{ bisects } AB\}$$

Area of shaded region = Area of square $ABCD$ – (Area of sector $APEC$ + Area of sector $PFQB$ + ...)

Area of sector $RGQC$ + Area of sector $RHSD$)

$$= 12^2 - \left(\frac{\pi(6)^2}{4} + \frac{\pi(6)^2}{4} + \frac{\pi(6)^2}{4} + \frac{\pi(6)^2}{4} \right)$$

$$= 12^2 - \pi \times 36 = 144 - 113.04 = 30.96 \text{ cm}^2$$



Q. 1. A hemispherical depression is cut from one face of a cubical block, such that diameter 'l' of hemisphere is equal to the edge of cube. Find the surface area of the remaining solid. [CBSE (F) 2014]

Sol. Let the radius of hemisphere = r

Therefore, $r = \frac{l}{2}$

Now, the required surface area = Surface area of cubical block - Area of base of hemisphere + Curved surface area of hemisphere

$$\begin{aligned} &= 6(\text{side})^2 - \pi r^2 + 2\pi r^2 \\ &= 6l^2 - \pi \left(\frac{l}{2}\right)^2 + 2\pi \left(\frac{l}{2}\right)^2 \\ &= 6l^2 - \frac{\pi l^2}{4} + \frac{\pi l^2}{2} = 6l^2 + \frac{\pi l^2}{4} \end{aligned}$$

Surface area = $\frac{1}{4}(24 + \pi)l^2$ units

Q. 1. Three solid metallic spherical balls of radii 3 cm, 4 cm and 5 cm are melted into a single spherical ball, find its radius.

[CBSE 2014]

Sol. Given, radius of three solid metallic spherical balls are $r_1 = 3$ cm, $r_2 = 4$ cm and $r_3 = 5$ cm.

Total volume of three spherical balls

$$\begin{aligned} &= \frac{4}{3}\pi(r_1^3 + r_2^3 + r_3^3) \\ &= \frac{4}{3}\pi(3^3 + 4^3 + 5^3) \\ &= \frac{4}{3}\pi(27 + 64 + 125) = \frac{4}{3}\pi \times 216 \text{ cm}^3 \end{aligned}$$

Since, three solid metallic spherical balls are melted into a single spherical ball.

Let R be the radius of a single spherical ball.

According to the question,

$$\begin{aligned} \frac{4}{3}\pi R^3 &= \frac{4}{3}\pi \times 216 \\ \Rightarrow R^3 &= 216 \\ \Rightarrow R &= \sqrt[3]{216} = 6 \text{ cm} \end{aligned}$$

Hence, the radius of single spherical ball is 6 cm.

Q.12. A solid consisting of a right circular cone of height 120 cm and radius 60 cm standing on a hemisphere of radius 60 cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm. [NCERT, CBSE 2011, 14]

Sol. Given, solid is a combination of a cone and a hemisphere and it is placed into a right circular cylinder.

Height of the cylinder (h)

$$= 180 \text{ cm} = 1.8 \text{ m}$$

$$[\because 1 \text{ m} = 100 \text{ cm} \Rightarrow 1 \text{ cm} = \frac{1}{100} \text{ m}]$$

and radius of the cylinder (r)

\therefore Volume of water filled in a right circular cylinder

$$\begin{aligned} &= \pi r^2 h = \frac{22}{7} \times 0.6 \times 0.6 \times 1.8 \\ &= \frac{14.256}{7} \text{ m}^3 \end{aligned}$$

For conical portion,

$$\text{Height } (h_1) = 120 \text{ cm} = 1.2 \text{ m}$$

$$\text{Radius } (r_1) = 60 \text{ cm} = 0.6 \text{ m}$$

For hemispherical portion,

$$\text{Radius } (r_2) = 60 \text{ cm} = 0.6 \text{ m}$$

\therefore Volume of the solid = Volume of the cone + Volume of the hemisphere

$$\begin{aligned} &= \frac{1}{3} \times \pi r_1^2 h_1 + \frac{2}{3} \pi r_2^3 \\ &= \frac{1}{3} \times \frac{22}{7} \times (0.6)^2 \times (1.2) + \frac{2}{3} \times \frac{22}{7} \times (0.6)^3 \\ &= \frac{22}{21} \times (0.6)^2 \{1.2 + 2 \times 0.6\} \\ &= \frac{22}{21} \times 0.36(1.2 + 1.2) = \frac{22}{21} \times 0.36 \times 2.4 \\ &= \frac{19.008}{21} = \frac{6.336}{7} \text{ m}^3 \end{aligned}$$

Now, on putting the solid into cylinder, the volume of water flow out from cylinder will be equal to volume of solid.

$$\begin{aligned} \therefore \text{The volume of water left in the cylinder} &= \text{Volume of water filled in a right circular cylinder} - \text{Volume of the solid} \\ &= \frac{14.256}{7} - \frac{6.336}{7} = \frac{7.92}{7} \\ &= 1.131428 \text{ m}^3 \approx 1.131 \text{ m}^3 \end{aligned}$$

Q. 5. Water is flowing at the rate of 5 km/hour through a pipe of diameter 14 cm into a rectangular tank of dimensions 50 m x 44 m. Find the time in which the level of water in the tank will rise by 7 cm.

[Delhi Compt. Set-I, II, III 2017]

Sol. Speed of water in pipe = 5 km/hour
 In an hour length of water = 5000 m
 Let time taken to fill the tank be t .
 \therefore Total length of water = $t \times 5000$ m
 Volume of water flown = Volume of water in tank
 $\Rightarrow \pi r^2 h = l \times b \times h$
 $\Rightarrow \frac{22}{7} \times \left(\frac{7}{100}\right)^2 \times 5000t = 50 \times 44 \times \frac{7}{100}$
 $\Rightarrow \frac{22}{7} \times \frac{7}{100} \times \frac{7}{100} \times 5000t = 50 \times 44 \times \frac{7}{100}$
 $\Rightarrow t = \frac{50 \times 44}{22 \times 50} = 2$

Hence, Time taken to fill the tank = 2 hours.

Q. 3. A solid cylinder of diameter 12 cm and height 15 cm is melted and recast into toys in the shape of a cone of radius 3 cm and height 9 cm. Find the number of toys formed so.

[Outside Delhi Compt. Set-II, III 2017]

Sol. Given, height of cylinder = 15 cm
 its diameter = 12 cm
 radius = 6 cm
 radius of cone = 3 cm
 and height = 9 cm

Let the number of toys recast be n .

\therefore Volume of n conical toys = Volume of cylinder
 $n \times \frac{1}{3} \pi \times 3 \times 3 \times 9 = \pi \times 6 \times 6 \times 15$
 $n = \frac{6 \times 6 \times 15}{3 \times 9}$
 $= 20$

Hence the number of toys = 20

Q. 3. A solid iron in the form of a cuboid of dimensions 49 cm x 33 cm x 24 cm is melted to form a solid sphere. Find the radius of sphere. [NCERT Exemplar; CBSE 2011]

Sol. Let r be radius of sphere.

\because Cuboid is melted to form a solid sphere,
 \therefore Volume of the sphere = Volume of the cuboid
 $\frac{4}{3} \pi r^3 = 49 \times 33 \times 24$
 $\Rightarrow \frac{4}{3} \times \frac{22}{7} \times \frac{r^3}{7} = 49 \times 33 \times 24$
 $\Rightarrow r^3 = \frac{49 \times 33 \times 24 \times 3 \times 7}{4 \times 22}$
 $= 343 \times 81$
 $r^3 = (7 \times 3)^3$
 $\Rightarrow r = 7 \times 3 = 21 \text{ cm}$

Q. 8. A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and the diameter of the base is 4 cm. Determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference of the volume of the cylinder and toy. (Take $\pi = 3.14$) [NCERT; CBSE 2012]

Sol. Let BPC is a hemisphere and ABC is a cone.

Radius of hemisphere

$$\begin{aligned} &= \text{radius of cone} \\ &= \frac{4}{2} \\ &= 2 \text{ cm} \\ &h = \text{height of cone} \\ &= 2 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Volume of toy} &= \frac{2}{3} \pi r^3 + \frac{1}{3} \pi r^2 h \\ &= \frac{2}{3} \times 3.14 \times 2^3 + \frac{1}{3} \times 3.14 \times 2^2 \times 2 \\ &= 25.12 \text{ cm}^3 \quad \dots(1) \end{aligned}$$

Let right circular cylinder $EFGH$ circumscribe the given solid toy.

$$\begin{aligned} \text{Radius of cylinder} &= 2 \text{ cm}, \text{ Height of cylinder} \\ &= 4 \text{ cm} \\ \text{Volume of right circular cylinder} &= \pi r^2 h \\ &= 3.14 \times 2^2 \times 4 \text{ cm}^3 \\ &= 50.24 \text{ cm}^3 \\ \therefore \text{Required volume} &= \text{Volume of cylinder} - \text{Volume of toy} \\ &= 50.24 - 25.12 = 25.12 \text{ cm}^3 \end{aligned}$$

Q. 1. From each end of a solid metal cylinder, metal was scooped out in hemispherical form of same diameter. The height of the cylinder is 10 cm and its base is of radius 4.2 cm. The rest of the cylinder is melted and converted into a cylindrical wire of 1.4 cm thickness. Find the length of the wire. [Use $\pi = \frac{22}{7}$]. [Outside Delhi Set I, II, III, 2015]

Sol. Volume of cylinder = $\pi r^2 h$
 $= \frac{22}{7} \times \frac{42}{10} \times \frac{42}{10} \times 10 \text{ cm}^3$
 $= 554.40 \text{ cm}^3$

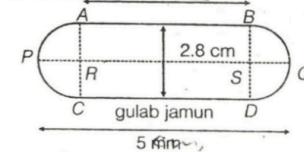
Volume of metal scooped out = 2 \times volume of hemisphere
 $= 2 \times \frac{2}{3} \pi r^3$
 $= \frac{4}{3} \pi r^3$
 $= \frac{4}{3} \times \frac{22}{7} \times \left(\frac{42}{10}\right)^3$
 $= 310.46 \text{ cm}^3$

Volume of rest of cylinder = $554.40 - 310.46$
 Let the length of wire be l cm

$$\begin{aligned} \therefore \text{Volume of wire} &= \pi r^2 h \\ \text{and} \quad \pi r^2 h &= 243.94 \text{ cm}^3 \\ \frac{22}{7} \times \frac{7}{10} \times \frac{7}{10} \times h &= 243.94 \text{ cm}^3 \\ \text{or,} \quad h &= \frac{243.94 \times 10 \times 10}{22 \times 7} \\ &= 158.4 \text{ cm} \end{aligned}$$

Q.11. A gulab jamun contains sugar syrup upto about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm (see figure)? [NCERT, CBSE 2012]

Sol. Given, one gulab jamun is a combination of a cylinder and two hemispheres.



Given, total length of one gulab jamun = 5 cm and diameter = 2.8 cm

\therefore Radius of cylindrical part

$$\begin{aligned} &= \text{Radius of hemispherical part} \\ &= \frac{2.8}{2} = 1.4 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{And height of cylindrical part, } h &= PQ - (PR + SQ) \\ &= 5 - (1.4 + 1.4) \\ &= 5 - 2.8 = 2.2 \text{ cm} \end{aligned}$$

\therefore Volume of one gulab jamun

$$\begin{aligned} &= 2 \times \text{Volume of hemispherical part} + \text{Volume of cylindrical part} \\ &= 2 \times \left\{ \frac{2}{3} \pi r^3 \right\} + \pi r^2 h = \frac{4}{3} \pi r^3 + \pi r^2 h \\ &= \pi r^2 \left\{ \frac{4r}{3} + h \right\} \\ &= \frac{22}{7} \times 1.4 \times 1.4 \left\{ \frac{4}{3} \times 1.4 + 2.2 \right\} \\ &= \frac{22}{7} \times \frac{14}{10} \times \frac{14}{10} \left\{ \frac{4}{3} \times \frac{14}{10} + \frac{22}{10} \right\} \\ &= 22 \times \frac{1}{5} \times \frac{7}{5} \left\{ \frac{28}{15} + \frac{11}{5} \right\} = \frac{154}{25} \times \frac{61}{15} \\ &= \frac{9394}{375} \text{ cm}^3 \end{aligned}$$

Now, volume of 45 gulab jamuns = $45 \times \frac{9394}{375}$

$$= \frac{1}{75} \times 84546 = 1127.28 \text{ cm}^3$$

Since, one gulab jamun contains sugar syrup upto about 30% of its volume.

Hence, quantity of syrup found in 45 gulab jamuns,

$$\begin{aligned} &= 1127.28 \times \frac{30}{100} = 1127.28 \times \frac{3}{10} \\ &= 338.184 \approx 338 \text{ cm}^3 \end{aligned}$$

Question : A solid right cylinder cone is cut into two parts at the middle of its height by a plane parallel to its base. The ratio of the volume of the smaller cone to the whole cone is

- (a) 1 : 2
- (b) 1 : 4
- (c) 1 : 6
- (d) 1 : 8

Question : The total surface area of a hemisphere of radius 'r' is

- (a) $2\pi r^2$
- (b) $4\pi r^2$
- (c) $3\pi r^2$
- (d) $5\pi r^2$

Question : The curved surface area of a sphere of radius 7 cm is:

- (a) 516 cm^2
- (b) 616 cm^2
- (c) 716 cm^2
- (d) 880 cm^2

Question : The curved surface area of a hemisphere of radius 21 cm is:

- (a) 2772 cm^2
- (b) 2564 cm^2
- (c) 3772 cm^2
- (d) 4772 cm^2

Question : The curved surface area of a sphere of radius 14 cm is:

- (a) 2464 cm^2
- (b) 2428 cm^2
- (c) 2464 cm^2
- (d) none of these.

Question : The curved surface area of a sphere of diameter 14 cm is:

- (a) 516 cm^2
- (b) 616 cm^2
- (c) 716 cm^2
- (d) 880 cm^2

Question : Total surface area of hemisphere of radius 10 cm is

- (a) 942 cm^2
- (b) 940 cm^2
- (c) 842 cm^2
- (d) 840 cm^2

Question : The radius of a spherical balloon increases from 7 cm to 14 cm s air is being pumped into it.

The ratio of surface area of the balloon in the two cases is:

- (a) 4 : 1
- (b) 1 : 4
- (c) 3 : 1
- (d) 1 : 3

Question : A matchbox measures 4 cm x 2.5 cm x 1.5 cm. The volume of packet containing 12 such boxes is:

- (a) 160 cm^3
- (b) 180 cm^3
- (c) 160 cm^2
- (d) 180 cm^2

Question : A cuboidal water tank is 6 m long, 5 m wide and 4.5 m deep. How many litre of water can it hold?

- (a) 1350 liters
- (b) 13500 liters
- (c) 135000 liters
- (d) 135 liters

Question : A godown measures $40\text{ m} \times 25\text{ m} \times 10\text{ m}$. Find the maximum number of wooden crates each measuring $1.5\text{ m} \times 1.25\text{ m} \times 0.5\text{ m}$ that can be stored in the godown.

- (a) 18000
- (b) 16000
- (c) 15000
- (d) 14000

Question : The surface area of a cuboid is

- (a) $2(lb + bh + lh)$
- (b) $3(lb + bh + lh)$
- (c) $2(lb - bh - lh)$
- (d) $3(lb - bh - lh)$

Question : The surface area of a cube if edge 'a' is

- (a) $7a^2$
- (b) $6a^2$
- (c) $5a^3$
- (d) $5a^2$

Question : The length, breadth and height of a room is 5m, 4m and 3m. The cost of white washing its four walls at the rate of Rs. 7.50 per m^2 is

- (a) Rs. 110
- (b) Rs. 109
- (c) Rs. 220
- (d) Rs. 105

Question : The perimeter of floor of rectangular hall is 250m. The cost of the white washing its four walls is Rs. 15000. The height of the room is

- (a) 5m
- (b) 4m
- (c) 6m
- (d) 8m

Question : The breadth of a room is twice its height and is half of its length. The volume of room is 512dm^3 . Its dimensions are

- (a) 16 dm, 8 dm, 4 dm
- (b) 12 dm, 8 dm, 2 dm
- (c) 8 dm, 4 dm, 2 dm
- (d) 10 dm, 15 dm, 20 dm

Question : The area of three adjacent faces of a cube is x, y and z. Its volume V is

- (a) $V = xyz$
- (b) $V^3 = xyz$
- (c) $V^2 = xyz$
- (d) none of these

Question : Two cubes each of edge 12 cm are joined. The surface area of new cuboid is

- (a) 140 cm^2
- (b) 1440 cm^2
- (c) 144 cm^2
- (d) 72 cm^2

Question : The curved surface area of cylinder of height 'h' and base radius 'r' is

- (a) $2\pi rh$
- (b) πrh
- (c) $12\pi rh$
- (d) none of these

Question : The total surface area of cylinder of base radius 'r' and height 'h' is

- (a) $2\pi(r + h)$
- (b) $2\pi r(r + h)$
- (c) $3\pi r(r + h)$
- (d) $4\pi r(r + h)$

Question : A metal pipe is 77 cm long. Inner diameter of cross section is 4 cm and outer diameter is 4.4 cm. Its inner curved surface area is:

- (a) 864 cm^2
- (b) 968 cm^2
- (c) 768 cm^2
- (d) none of these

Question : The diameter of a roller is 84 cm and its length is 120 cm. It takes 500 complete revolutions to move once over to level a playground. The area of the playground in m^2 is:

- (a) 1584
- (b) 1284
- (c) 1384
- (d) 1184

Question : A cylindrical pillar is 50 cm in diameter and 3.5 m in height. The cost of painting its curved surface at the rate of Rs. 12.50 per m^2 is:

- (a) Rs. 68.75
- (b) Rs. 58.75
- (c) Rs. 48.75
- (d) Rs. 38.75

Question : The inner diameter of circular well is 3.5m. It is 10m deep. Its inner curved surface area in m^2 is:

- (a) 120
- (b) 110
- (c) 130
- (d) 140

Question : In a hot water heating system there is a cylindrical pipe of length 28 m and diameter 5 cm. The total radiating surface area in the system in m^2 is:

- (a) 6.6
- (b) 5.5
- (c) 4.4
- (d) 3.4

Question : The curved surface area of a right circular cone of slant height 10 cm and base radius 7 cm is

- (a) 120 cm^2
- (b) 220 cm^2
- (c) 240 cm^2
- (d) 140 cm^2

Question : The height of a cone is 16 cm and base radius is 12 cm. Its slant height is

- (a) 10 cm
- (b) 15 cm
- (c) 20 cm
- (d) 8 cm

Question : The curved surface area of a right circular cone of height 16 cm and base radius 12 cm is

- (a) 753.6 cm^2
- (b) 1205.76 cm^2
- (c) 863.8 cm^2
- (d) 907.6 cm^2

Question : The curved surface area of a right circular cone of slant height 10 cm and base radius 10.5 cm is

- (a) 185 cm^2
- (b) 160 cm^2
- (c) 165 cm^2
- (d) 195 cm^2

Question : The slant height of a cone is 26 cm and base diameter is 20 cm. Its height is

- (a) 24 cm
- (b) 25 cm
- (c) 23 cm
- (d) 35 cm

Question : If the lateral surface of a cylinder is 94.2 cm^2 and its height is 5 cm , then find radius of its base

- (a) 5cm
- (b) 4cm
- (c) 3cm
- (d) 6cm

Question : It costs Rs 2200 to paint the inner curved surface of a cylindrical vessel 10 m deep. If the cost of painting is at the rate of Rs 20 per m^2 , find radius of the base,

- (a) 1.75 m
- (b) 1.85 m
- (c) 1.95 m
- (d) 1.65 m

Question : The height and the slant height of a cone are 21 cm and 28 cm respectively. Find the volume of the cone.

- (a) 5546 cm^3
- (b) 7546 cm^3
- (c) 5564 m^3
- (d) 8546 cm^3

Question : Find the volume of the right circular cone with radius 6 cm , height 7 cm

- (a) 254 cm^3
- (b) 264 cm^3
- (c) 274 cm^2
- (d) 284 cm^3

Question : The radius and height of a conical vessel are 7 cm and 25 cm respectively. Its capacity in litres is

- (a) 1.232 litre
- (b) 1.5 litre
- (c) 1.35 litre
- (d) 1.6 litre

Question : The height of a cone is 15 cm . If its volume is 1570 cm^3 , find the radius of the base.

- (a) 12 cm
- (b) 10 cm
- (c) 15 cm
- (d) 18 cm

Question : If the volume of a right circular cone of height 9 cm is $48\pi \text{ cm}^3$, find the diameter of its base.

- (a) 12 cm
- (b) 10 cm
- (c) 6 cm
- (d) 8 cm

Question : A conical pit of top diameter 3.5 m is 12 m deep. What is its capacity in kilolitres?

- (a) 38.5 kl
- (b) 48.5 kl
- (c) 39.5 kl
- (d) 47.5 kl

Question : Find the capacity in litres of a conical vessel with radius 7 cm , slant height 25 cm

- (a) 1.232 litre
- (b) 1.5 litre
- (c) 1.35 litre
- (d) none of these

Question : The diameter of the moon is approximately one-fourth of the diameter of the earth. What fraction of the volume of the earth is the volume of the moon?

- (a) $1/64$
- (b) $1/32$
- (c) $1/16$
- (d) $1/48$

Question : 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

Question : Small spheres, each of radius 2cm, are made by melting a solid iron ball of radius 6cm, then the total number of small spheres is

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

Question : A solid sphere of radius r cm is melted and recast into the shape of a solid cone of height r . Then the radius of the base of cone is

- (a) $2r$
- (b) r
- (c) $4r$
- (d) $3r$

Question : Three solid spheres of diameters 6cm, 8cm and 10cm are melted to form a single solid sphere. The diameter of the new sphere is

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

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

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

Question : The circular ends of a bucket are of radii 35 cm and 14 cm and the height of the bucket is 40 cm. Its volume is

- (a) 60060 cm^3
- (b) 80080 cm^3
- (c) 70040 cm^3
- (d) 80160 cm^3

Question : If the radii of the ends of a bucket are 5 cm and 15 cm and it is 24 cm high, then its surface area is

- (a) 1815.3 cm^2
- (b) 1711.3 cm^2
- (c) 2025.3 cm^2
- (d) 2360 cm^2

Question : If the radii of the ends of a 42 cm high bucket are 16 cm and 11 cm, determine its capacity
(take $\pi = 22/7$)

- (a) 24222 cm^3
- (b) 24332 cm^3
- (c) 24322 cm^3
- (d) none of these

Question : The length, breadth and height of a cuboidal solid is 4 cm, 3 cm and 2 cm respectively. Its volume is

- (a) $(4 + 3 + 2)$ cm^3
- (b) $2(4 + 3 + 2)$ cm^3
- (c) $(4 \times 3 \times 2)$ cm^3
- (d) $2(4 + 3) \times 2$ cm^3