

PRERNA EDUCATION

IIT/ MEDICAL/ FOUNDATION

SAMPLE QUESTIONS

SURFACE AREAS AND VOLUMES

Q.No. 1 If surface area of cube is 216 cm^2 . Then, its volume will be

- (a) 216 cm^3 (b) 180 cm^3 (c) 90 cm^3 (d) 343 cm^3

Ans. (a)

Q.No. 2 The volume of a cylinder is 539 cm^3 , and its height 14 cm. Find the radius of its base.

- (a) 7 cm (b) 3 cm (c) 3.5 cm (d) None of these

Ans. (c)

Q.No. 3 If height and radius of cone are 4 cm and 3 cm. then its curved surface area will be

- (a) 47.1 cm^2 (b) 49 cm^2 (c) 50 cm^2 (d) 50.1 cm^2

Ans. (a)

Q.No. 4 A solid cylinder of diameter 12 cm and height 15 cm is melted and recast into toys with the shape of a right circular cone mounted on a hemisphere of radius 3 cm. If the height of the toy is 12 cm, find the number of toys so formed.

- (a) 13 (b) 14 (c) 15 (d) None of these

Ans. (d)

Q.No. 5 Water flows through a circular pipe, whose internal diameter is 2 cm, at the rate of 0.7 m per second into a cylindrical tank, the radius of whose base is 40 cm. By how much will the level of water in the cylindrical tank rise in half an hour?

- (a) 70 cm (b) 75 cm (c) 78.75 cm (d) 77.25 cm

Ans. (c)

Q.No. 6 A solid metallic sphere of radius 12 cm is melted and recast into a number of small cones, each of radius 4 cm and height 3 cm. Find the number of cones so formed.

- (a) 136 (b) 144 (c) 140 (d) None of these

Ans. (b)

Q.No. 7 Water is flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. Find the time in which the level of water in the tank will rise by 21 m.

- (a) 3 hours (b) 2 hours (c) 4 hours (d) None of these

Ans. (b)

Q.No. 8 A heap of rice is in the form of a cone of radius 3 m and height 3 m. Find the volume of the rice. How much cloth is required to just cover the heap?

- (a) $\frac{198\sqrt{2}}{7} \text{ m}^2$ (b) $\frac{200\sqrt{2}}{7} \text{ m}^2$ (c) $\frac{188\sqrt{3}}{7}$ (d) None of these

Ans. (a)

Q.No. 9 A solid metallic hemisphere of radius 6 cm is melted and recast into a right circular cone of base radius 3 cm. Determine the height of the cone.

- (a) 58 cm (b) 48 cm (c) 50 cm (d) None of these

Ans. (b)

Q.No. 10 How many shots each having radius 3 cm can be made from a cubical lead solid of dimensions 49 cm x 36 cm x 22 cm?

- (a) 300 (b) 363.4 (c) 365 (d) None of these

Ans. (b)

Q.No. 11 Three cubes of a metal whose edges are in the ratio 3 : 4 : 5 are melted and converted into a single cube of diagonal $24\sqrt{3}$ cm. Find the edges of the three cubes.

- (a) 8 cm (b) 6 cm (c) 4 cm (d) None of these

Ans. (c)

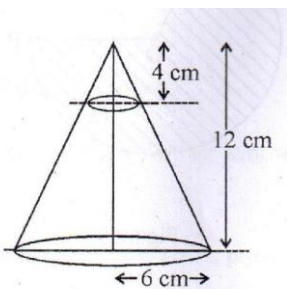
Q.No. 12 The rain water from a roof 22 m x 20 m drains into a cylindrical vessel having diameter of base 2 m and height 3.5 m of the vessel is just full, find the rainfall in cm.

- (a) 3.5 cm (b) 2 cm (c) 4 cm (d) None of these

Ans. (d)

Q.No. 13 In fig , from the top of a solid cone of height 12 cm and base radius 6 cm, a cone of height 4 cm is removed by a plane parallel to the base. Find the total surface area of the remaining solid. (Use

$\pi = \frac{22}{7}$ and $\sqrt{5} = 2.236$)



- (a) 355 cm² (b) 350.6 cm² (c) 370 cm² (d) 357.5cm²

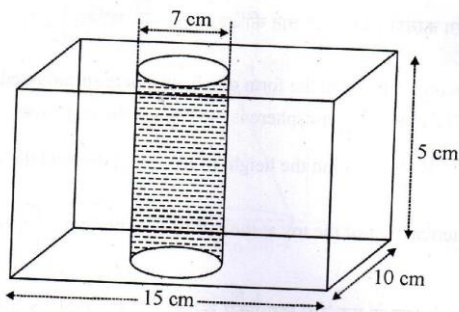
Ans. (b)

Q.No. 14 A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5cm and the total wood used in the making of toy is $166\frac{5}{6}$ cm³. Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of Rs.10 per cm².

- (a) 6cm, Rs,770 (b)6cm, Rs.700 (c) 6cm, Rs.750 (d)7cm, Rs.770

Ans. (a)

Q.No. 15 In fig , form a cuboidal solid metallic be 15 cm x 10 cm x 5 cm, a cylindrical hole of diameter 7 cm is drilled out. find the surface area of the remaining block [Use $\pi = \frac{22}{7}$]



- (a) 580 cm^2 (b) 515 cm^2 (c) 583 cm^2 (d) None of these

Ans. (a)

Q.No. 16 Due to sudden floods some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% the cost. if the lower part of each tent is of the form of a cylinder of diameter 4.2 m an height 4m with the conical upper part of same diameter but of height 2.8m and the canvas to be used cost Rs100 per sq. m, find the amount , the associations will have to pay. [Use $\pi = \frac{22}{7}$].

- (a) Rs 380000 (b) Rs 379500 (c) Rs 379000 (d) None of these

Ans. (b)

Q.No. 17 A hemispherical bowl of internal diameter 36 cm contains liquid. This liquid is filled into 72 cylindrical bottles of diameter 6cm. Find the height of the each bottle, if 10% liquid is wasted in this transfer.

- (a) 5.4 cm (b) 6.0 cm (c) 5.0 cm (d) 5.5 cm

Ans. (a)

Q.No. 18 504 cones, each of diameter 3.5 cm and height 3 cm, are melted and recast into a metallic sphere. Find the diameter of the sphere and hence find its surface area.

- (a) 21 cm, 1386 cm^2 (b) 21 cm, 1400 cm^2 (c) 15 cm, 1386 cm^2 (d) None of these

Ans. (a)

Q.No. 19 A cubical block of side 10cm is surmounted by a hemisphere. What is the largest diameter that the hemisphere can have? Find the cost of painting the total surface area of the solid so formed, at the rate of < 5 per 100 sq. cm. [Take $\pi = \frac{22}{7}$].

- (a)Rs.34 (b)Rs.33 (c)Rs.35 (d)Rs.36

Ans. (a)

Q.No. 20 A metallic cylinder has radius 3 cm and height 5 cm. To reduce its weight, a conical hole is drilled in the cylinder. The conical hole has a radius of $\frac{3}{2}$ cm and its depth is $\frac{8}{9}$ cm. Calculate the ratio of the volume of metal left in the cylinder to the volume of metal taken out in conical shape

- (a) 133:3 (b) 133:2 (c) 2:133 (d) 3:133

Ans. (b)

Q.No. 21 Find the number of coins 1.5 cm in diameter and 0.2 cm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.

(a) 350

(b) 300

(c) 400

(d) 450

Ans. (d)

Q.No. 22 The radius of the base and the height of a solid right circular cylinder are in the ratio 2 : 3 and its volume is 1617 cm³. Find the total surface area of the cylinder.

(a) 700cm²

(b) 770 cm²

(c) 750 cm²

(d) None of these

Ans. (b)

Q.No. 23 A well of diameter 4m is dug 14 m deep. The earth taken out is spread evenly all around the well to form a 40 cm high embankment. find the width of the embankment.

(a) 10m

(b) 12m

(c) 14m

(d) -14 m

Ans. (a)

Q.No. 24 Water is flowing at the rate of 2.52 km/hr through a cylindrical pipe into a cylindrical tank, the radius of whose base is 40 cm, if the increase in the level of water in the tank, in half an hour is 3.15 m, find the internal diameter of the pipe.

(a) 2cm

(b) 4cm

(c) 3cm

(d) 6 cm

Ans. (b)

Q.No. 25 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 $\pi = \frac{22}{7}$]

(a) 155 cm

(b) 158.4 cm

(c) 156.4 cm

(d) None of these

Ans. (b)

Q.No. 26 A vessel full of water is in the form of an inverted cone of height 8 cm and the radius of its top, which is open, is 5 cm. 100 spherical lead balls are dropped into the vessel. One-fourth of the water flows out of the vessel. Find the radius of a spherical ball.

(a) 0.5cm

(b) 0.25 cm

(c) 1 cm

(d) None of these

Ans. (a)

Q.No. 27 Milk in a container, which is in the form of a frustum of a cone of height 30 cm and the radii of whose lower and upper circular ends are 20 cm and 40 cm respectively, is to be distributed in a camp for flood victims. If this milk is available at the rate of Rs 35 per litre and 880 litres of milk is needed daily for a camp, find how many such containers of milk are needed for a camp and what cost will it put on the donor agency for this ?

(a) 10, Rs30800

(b) 10, Rs30000

(c) 12, Rs30800

(d) None of these

Ans. (a)

Q.No. 28 From a solid cylinder whose height is 8 cm and radius 6 cm, a conical cavity of height 8 cm and of base radius 6 cm, is hollowed out. Find the volume of the remaining solid correct to two places of decimals. Also find the total surface area of the remaining solid. (Use $\pi = 3.1416$)

(a) 603.19cm³, 600 cm²

(b) 602 cm³, 603,19cm²

(c) 603.19 cm³, 603.19 cm²

(d) None of these

Ans. (c)

Q.No. 29 A bucket is in the form of a frustum of a cone with capacity 12305.8 cm^3 of water. The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the total height of the bucket and the area of the metal sheet used in its making. (Use $\pi = 3.14$)

(a) $h = 15 \text{ cm}$, 2150 cm^2

(b) $h = 16 \text{ cm}$, 2150 cm^2

(c) $h = 16 \text{ cm}$, 2160.3 cm^2

(d) $h = 15 \text{ cm}$, 2160.3 cm^2

Ans. (d)

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