MATHS

BOOKS - EDUCART PUBLICATION

SURFACE AREAS AND VOLUMES

Objective Type Questions Multiple Choice Questions

1. The radius of a sphere (in cm) whose volume is $12\pi\ cm^3$, is

(A) 3

(B) $3\sqrt{3}$

(C) $\frac{3^2}{3}$

(D) $\frac{3^1}{3}$

A. 3

B. $3\sqrt{3}$

C. $3^{2/3}$

D. $3^{1/3}$

Answer: C

Watch Video Solution

2. A cylindrical pencil sharpend at one edge is the combination of

A. a cone and a cylinder

B. frustum of a cone and a cylinder

C. a hemisphere and a cylinder

D. two cylinders.

Answer: A

Watch Video Solution

3. A surahi is the combination of

A. a sphere and a cylinder

B. a hemisphere and a cylinder

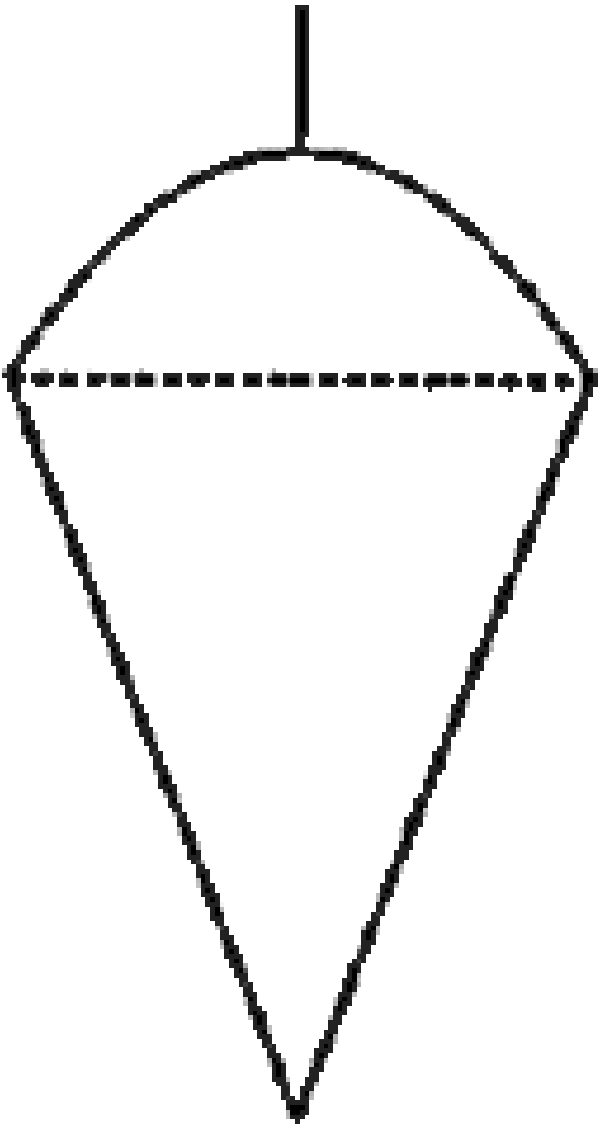
C. two hemispheres

D. a cylinder and a cone.

Answer: A

Watch Video Solution

4. A plumbline (Sahul) is a combination of (see the given figure) :



A. a cone and a cylinder

B. a hemisphere and a cone

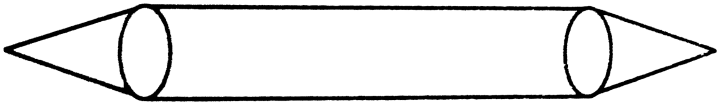
C. frustum of a cone and a cylinder

D. sphere and cylinder

Answer: B

Watch Video Solution

5. The sharpe of a gilli, the gilli-danda game (see figure) is a combination of



A. two cylinders

B. a cone and a cylinder

C. two cones and a cylinder

D. two cylinders and a cone

Answer: C

Watch Video Solution

6. A shuttle cock used for playing badminton has the shape of the combintion of

A. a cylinder and a sphere

B. a cylinder and a hemisphere

C. a sphere and a cone

D. frustum of a cone and a hemisphere

Answer: D

Watch Video Solution

7. A metallic sphere of diameter 20 cm is recast into a right circular cone of base radius 10 cm. What is the bigger height of the cone ?

A. 4 cm

B. 40 cm

C. 60 cm

D. 120 cm

Answer: B

Watch Video Solution

8. Three cubes each of side 15 cm are joined end to end. The total surface area of the cuboid is :

A. 3150 cm^2

B. 1575 cm^2

C. 1012.5 cm^2

D. 576.4 cm^2

Answer: A

 Watch Video Solution

9. If a hollow cube of internal edge 22 cm is filled with spherical marbles of diameter 0.5 cm 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

Answer: A

Watch Video Solution

10. A metallic spherical shell of internal and external diameters 4 cm and 8 cm, respectively is melted and recast into the form a cone of base diameter 8 cm. The height of the cone is

A. 12 cm

B. 14 cm

C. 15 cm

D. 18 cm

Answer: B

Watch Video Solution

11. A medicine -capsule is the shape of a cylinder of diameter 0.5 cm with two hemisphere stuck to each of its ends. The length of entire capsule is 2cm. The capacity of the capsule is

A. 0.36 cm^3

B. 0.35 cm^3

C. 0.34 cm^3

D. 0.33 cm^3

Answer: A

Watch Video Solution

12. If volume of two spheres are in the ratio $64:27$, then the ratio of their surface area is

A. $3:4$

B. $4:3$

C. $9:16$

D. $16:9$

Answer: D

 Watch Video Solution

13. The radius of the sphere is increased by 100%, the volume of the corresponding sphere is increased by :

A. 2

B. 5

C. 7

D. 8

Answer: C

 Watch Video Solution

14. The base radii of a cone and a cylinder are equal. If their curved surface areas are also equal, then the ratio of the slant height of the cone to the height of the cylinder is :

A. $2:1$

B. $1:2$

C. $1:3$

D. $3:1$

Answer: A

Watch Video Solution

15. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is ..... .

A. 60 πcm^2

B. 68 πcm^2

C. 120 πcm^2

D. 136 πcm^2

Answer: D

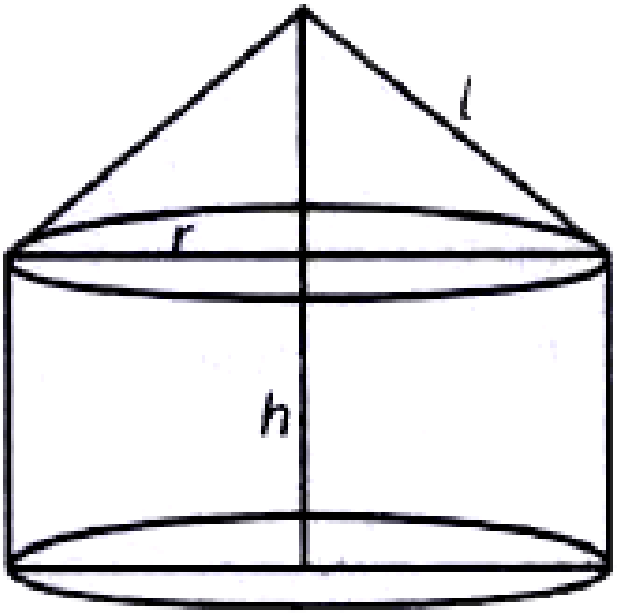
Watch Video Solution

Objective Type Questions Fill In The Blanks

1. A spherical metal ball of radius 8 cm is melted to make 8 smaller identical balls. The radius of each new ball is cm.

Watch Video Solution

2. The total surface area of the given solid figure is.....



Watch Video Solution

3. A solid sphere of radius r is melted and recast into the shape of a solid cone of height r. Find radius of the base of the cone.

Watch Video Solution

4. The ratio between the volumes of two spheres is 8 : 27. What is the ratiobetween their surface areas?

Watch Video Solution

5. The diameter of a sphere is 6 cm. It is melted and drawn into a wire of diameter 2 cm. The length of the wire is.

Watch Video Solution

6. If the radius of the base of a right circular cylinder is halved, keeping the height same, what is the ratio of the volume of the reduce cylinder to that of the original.

Watch Video Solution

7. The length of each side of a cube is doubled, then its volume become..... Times.

Watch Video Solution

Objective Type Questions True Or False

1. Two identical solid hemisphers of equal base radiu r cm are stuck together along their bases. The total surface area of the combination is $6\pi r^2$.

Watch Video Solution

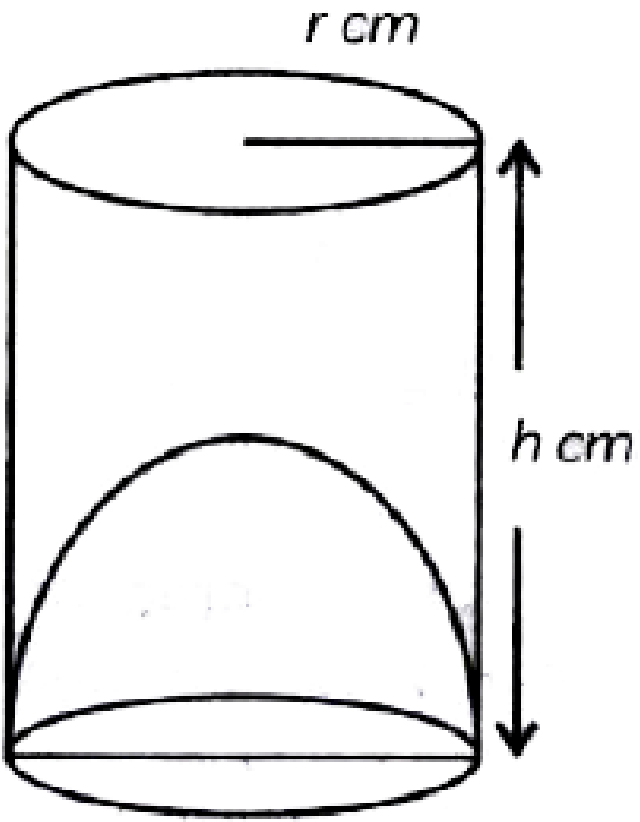
2. State True or False:

A solid ball is exactly fitted inside the cubical box of side a. The volume of the ball is $\frac{4}{3}\pi a^2$

Watch Video Solution

3. The capacity of a cylindrical vessesl with a hemispherical portion raised upwards at the bottom as shown in the given figure is

$\frac{\pi r^2}{3}[3h - 2r]$.



Watch Video Solution

Objective Type Questions Very Short Questions

1. Two cones have their heights in the ratio 1:3 and the radii of their bases in the ratio 3:1. Find the ratio of their volumes.

Watch Video Solution

2. Volume and surface area of a solid hemisphere are numerically equal. What is the diameter of the hemisphere. ?

Watch Video Solution

3. Find the maximum volume of a cone that can be carved out of a solid hemisphere of radius r.

Watch Video Solution

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

Watch Video Solution

5. A cone and a cylinder have the same radii but the height of the cone is 3 times that of the cylinder. Find the ratio of their volumes.

 Watch Video Solution

6. How many cubes of side 5 cm can be made from a solid cube of side 10 cm ?

 Watch Video Solution

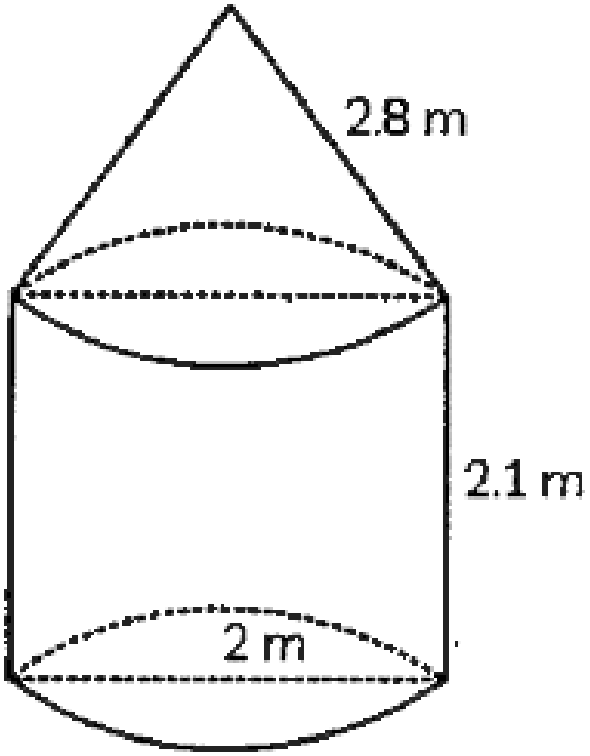
Short Answer Sa I Type Questions

1. 2 cubes, each of volume 125 cm^3, are joined end to end . Find the surface area of the resulting cuboid.

Watch Video Solution

2. In the figure, a tent is in the shape of a cylinder surmounted by a conical top. The cylindrical part is 2.1 m high and conical part has slant height 2.8 m. Both the parts have same radius 2m. Find the area of the canvas

used to make the tent. (Use $\pi = \frac{22}{7}$)



Watch Video Solution

3. From a solid right circular cylinder with height 10 cm and radius of the base 6 cm, a right circular cone of the same height and base is removed. Find the volume of the remaining solid. (Take $\pi = 3.14$)

Watch Video Solution

4. 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.

Watch Video Solution

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

Watch Video Solution

6. If the area of three adjacent faces of a cuboid are X, Y and Z respectively, then find the volume of cuboid.

Watch Video Solution

7. A solid metallic cuboid of dimensions $9m \times 8m \times 2$ is melted and recast in to solid cubes of edge 2 m .find the number of cubes so formed.

Watch Video Solution

8. Find the ratio of the volume of a cube to that of the sphere which fits inside the cube.

9. How many spherical bullets can be made out of a solid cube of lead whose edge measures 44 cm, each being 4 cm in diameter.

10. The sum of the radius of base and height of a solid right circular cylinder is 37 cm. If the total surface area of the solid cylinder is 1628 cm^2, find the volume of the cylinder. $\left(\pi = \frac{22}{7}\right)$

Watch Video Solution

11. The ratio of the volumes of two spheres is 8 : 27. If r and R are the radii of sphere respectively, then find the (R - r) : r.

Watch Video Solution

Short Answer Sa Ii Type Questions

1. A cone of height 24 cm and radius of base 6 cm is made up of modeling clay, A child reshapes it in the form of a sphere. Find the radius of the sphere and hence find the surface area of this sphere.

Watch Video Solution

2. Three metallic solid cubes whose edges are 3 cm ,4 cm and 5 cm melted and formed into a single cube . Find the edge of the cube formed.

Watch Video Solution

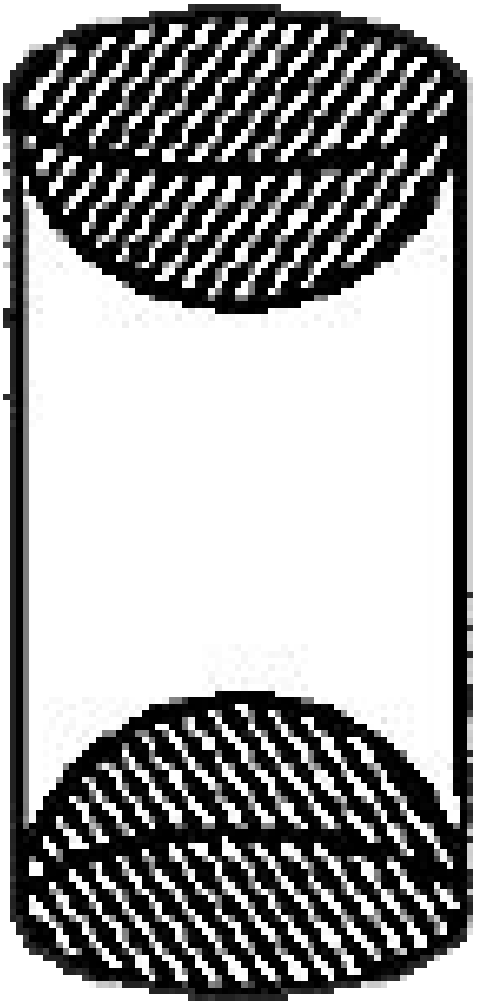
3. A solid is in the form of a cylinder with hemispherical ends. The total height of the solid is 20 cm and the diameter of the cylinder

is 7 cm. Find the total volume of the solid. (Use $F = \frac{22}{7}$)

Watch Video Solution

4. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in the figure. If the height of the cylinder is 10 cm and its base of radius 3.5

cm. Find the total surface area of the article.



Watch Video Solution

5. Two cones with same base radius 8 cm and height 15 cm are joined together along their bases. Find the surface area of the shape so formed.

Watch Video Solution

6. 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

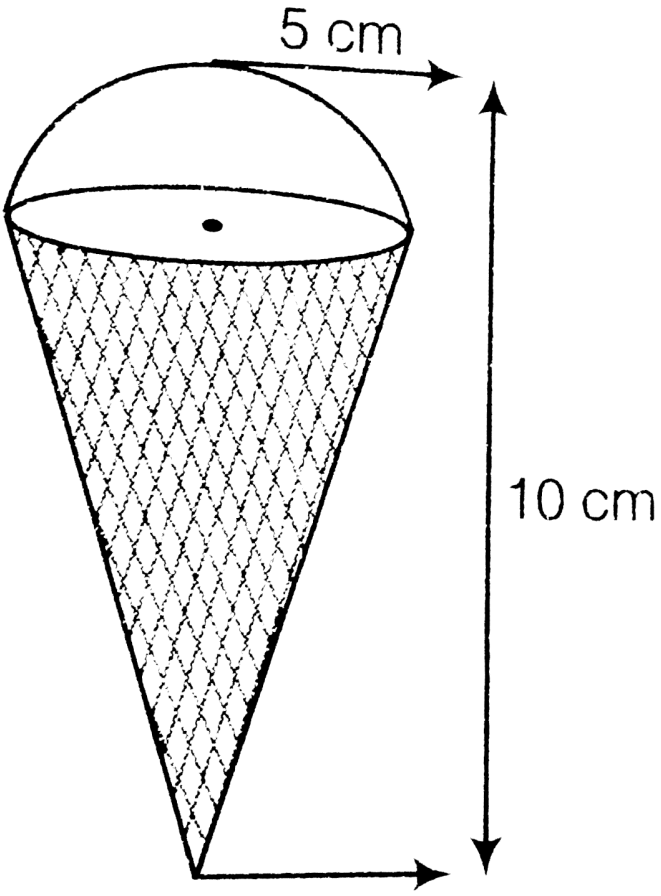
out. Find the total surface area of the remaining solid to the nearest cm^2 .

Watch Video Solution

7. The radius and height of a solid right circular cone are in the ratio of 5:12 .If its volume is 314 cm^3 Find its total surface area . $[Take\pi = 3.14]$

Watch Video Solution

8. An ice-ceram cone full of ice-cream having radius 5 cm height 10 cm as shown if figure.



Calculate the volume of ice-cream, provided that its $\frac{1}{6}$ part is left unfilled with ice-cream.

Watch Video Solution

9. A circus tent is in the shape of a cylinder surmounted by a conical top of same diameter. If their common diameter is 56 cm, the height of cylindrical part is 6 m and the total height of the tent above the ground is 27 m, find the area of canvas used in making the tent

Watch Video Solution

10. Mearbles of diameter 1.4 cm are dropped into a cylindrical beaker of diameter 7 cm, containing some water. Find the number of marbles that should be dropped into the beaker so that the water level rises by 5.6 cm.

Watch Video Solution

11. The surface area of a sphere is $2464cm^2$ If its radius be doubled, what e surface area of the new sphere?

Watch Video Solution

12. Rampal decided to donate canvas for 10 tents, conical in shape with base diameter 14 m and height 24 m to a centre for handicapped persons welfare. If the cost of $2m^2$ wide canvas is Rs. 40 , find the amount by which Rampal helped the centre.

Watch Video Solution

13. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with

water. The diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel?

Watch Video Solution

14. How many silver coins, 1.75 cm in diameter and of thickness 2 mm, must be melted to form a cuboid of dimensions $5.5cm \times 10cm \times 3.5cm$?

Watch Video Solution

15. A hemispherical tank full of water is emptied by a pipe at the rate of $3\frac{4}{7}$ litres per second. How much time will it take to make the tank half-empty, if the tank is 3 m in diameter?

Watch Video Solution

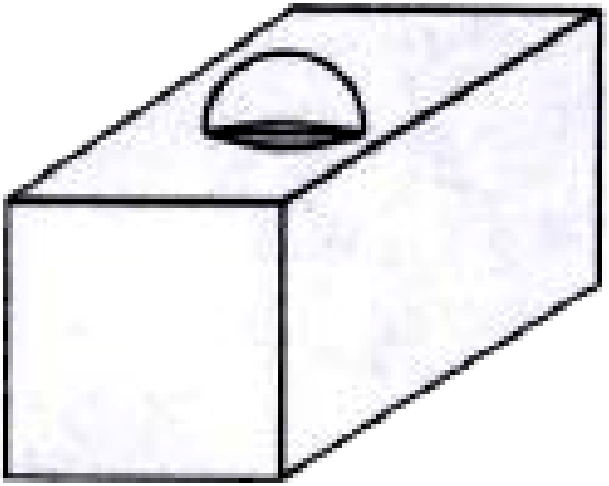
16. A cylindrical container is filled with ice-cream, whose diameter is 12 cm and height is 15 cm. The whole ice-cream is distributed to 10

children in equal cones having hemispherical tops. If the height of the conical portion is twice the diameter of its base, find the diameter of the ice-cream.

Watch Video Solution

17. The base of the block is a cube of side 6 cm and the hemisphere fixed on the top has a diameter of 3.5 cm. Find the total surface area

of the block. (use $\pi = \frac{22}{7}$)



Watch Video Solution

18. A heap of rice is in the form of a cone of of base diameter 24m and height 3.5 m. Find the

volume of the rice. How much canvas cloth is required to just cover the heap

Watch Video Solution

19. Sixteen glass spheres each of radius 2 cm are packed into a cuboidal box of internal dimensions 20 cm $\times$ 10 cm $\times$ 10 cm and then the box is filled with water. Find the volume of water filled in the box.

Watch Video Solution

20. Water in a canal 5.4 m wide and 1.8 m deep is following with a speed of $25km/hr$ How much area can it irriagae in 40 munutes if 10 cm of standing watr is required for irrigation?

Watch Video Solution

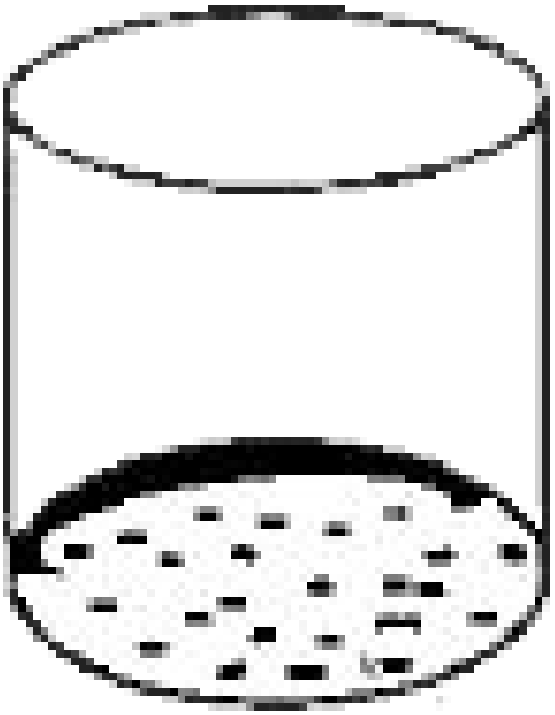
21. The dimentsions of a solid iron cuboid are $4.4m \times 2.6m \times 1.0m$ .It is melted and recast into a hollow cylindrical pipe of 30 cm inner radius and thickness 5cm .Find the length of the pipe.

Watch Video Solution

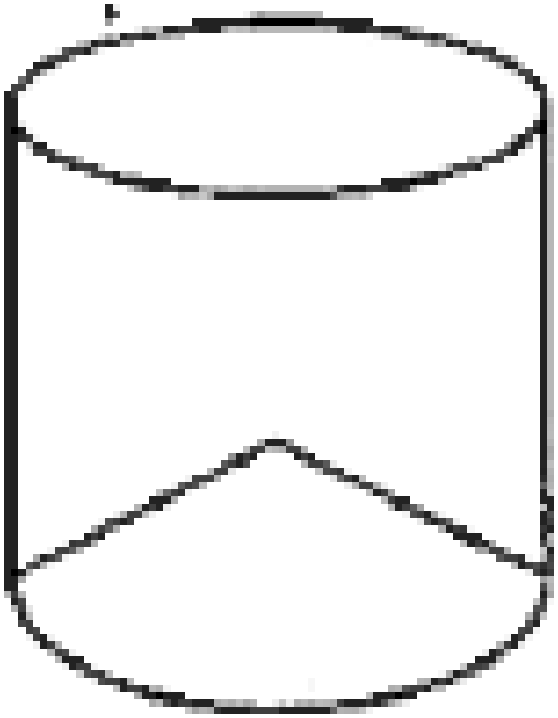
22. Isha is 10 years old girl. On the result day, Isha and her father Suresh were very happy as she got first position in the class. While coming back to their home, Isha asked for a treat from her father as a reward for her success. They went to a juice shop and asked for two glasses of juice.

Aisha, a juice seller, was serving juice to her customers in two types of glasses. Both the glasses had inner radius 3 cm. The height of

both the glasses was 10 cm.



First type : A Glass with hemispherical raised bottom.



Second type : A glass with conical raised bottom of height 1.5 cm.

Isha insisted to have the juice in first type of glass and her father decided to have the juice in second type of glass. Out of the two, Isha or

her father Suresh, who got more quantity of juice to drink and by how much ?

View Text Solution

23. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

Watch Video Solution

24. A conical vessel whose internal radius is 5 cm and height 24 cm, is full of water. The water is emptied into a cylindrical vessel with internal radius 10 cm. Find the height to which the water rises in the cylindrical vessel.

Watch Video Solution

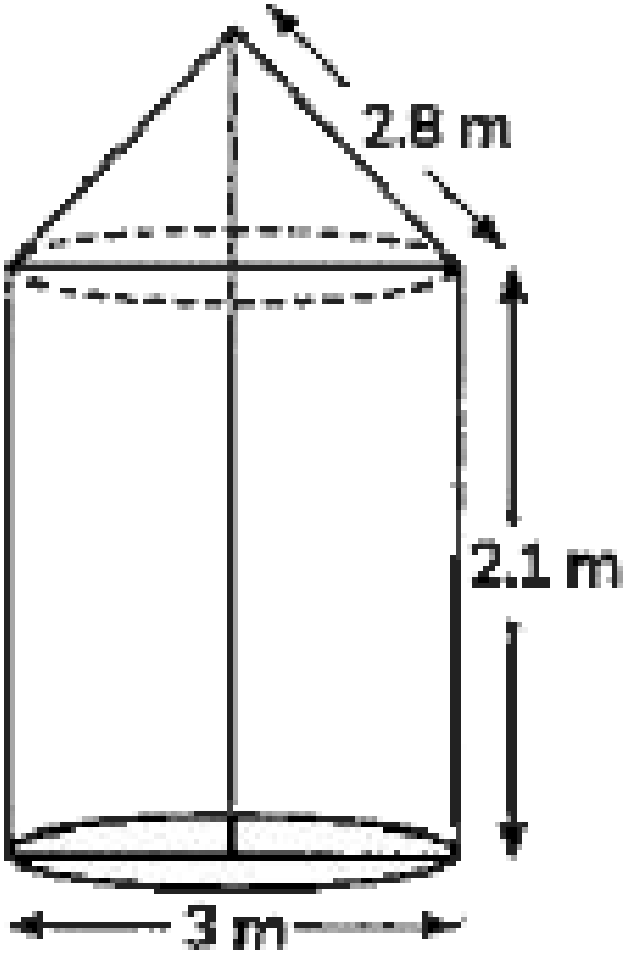
25. A sphere of diameter 12 cm, is dropped in a right circular cylindrical vessel, partly filled with water. If the sphere is completely

submerged in water, the water level in the cylindrical vessel rises by $3\frac{5}{9}cm$. Find the diameter of the cylindrical vessel.

Watch Video Solution

26. In given figure, a tent is in the shape of a cylinder surmounted by a conical top of same diameter. If the height and diameter of cylindrical part are 2.1 m and 3 m respectively and the slant height of conical part is 2.8 m, find the cost of canvas needed to make the

tent if the canvas is available at the rate of Rs. 500/sq. metre. (Use $\pi = \frac{22}{7}$)



View Text Solution

27. Due to sudden floods, some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% of the cost, If the lower part of each tent is of the form of a cylinder of diameter 4.2 m and height 4 m with the conical upper part of same diameter but of height 2.8 m, and the canvas to be used costs 100 per sq. m, find the amount the associations will have to pay. What values are shown by these associations [Use $\pi = \frac{22}{7}$]

Watch Video Solution

28. A hemispherical bowl of internal diameter 36 cm contains liquid. This liquid is filled into 72 cylindrical bottles of diameter 6 cm. Find the height of each bottle if 10% liquid is wasted in this transfer.

Watch Video Solution

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

Watch Video Solution

30. 504 cones, each of diameter 3.5 cm height 3 cm, are melted and recast into a metallic sphere. Find the diameter of the sphere and hence find its surface area.

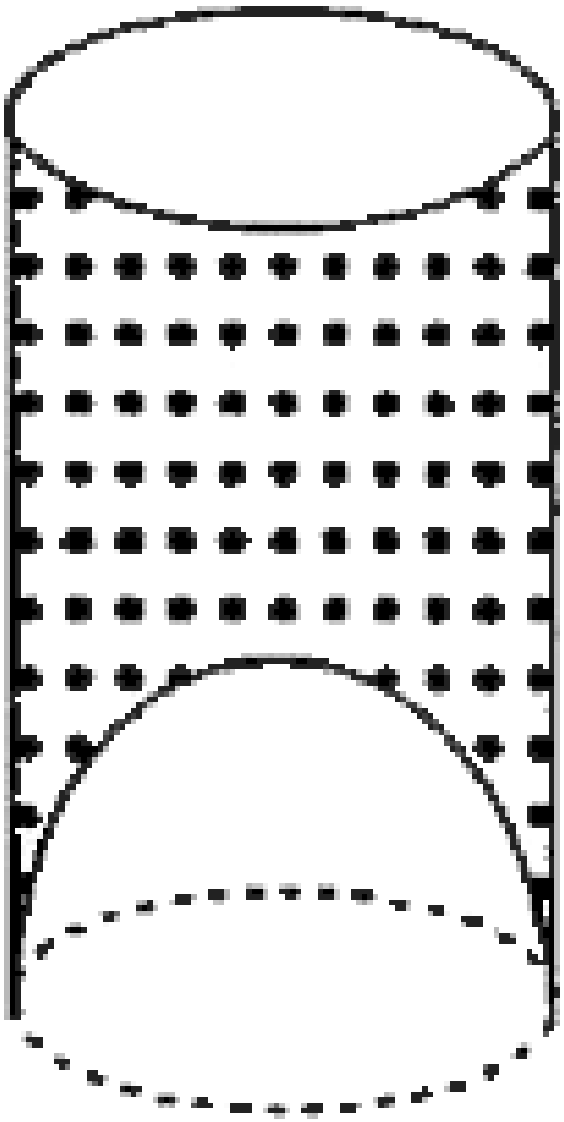
Watch Video Solution

31. In a cylindrical vessel of radius 10 cm, containing some water, 9000 small spherical balls are dropped which are completely immersed in water which raises the water level. If wach spherical ball is radius 0.5 cm , then find the rise in the level of water in the vessel.

Watch Video Solution

32. A juice seller was serving his costumers using glasses as shown in the 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 π = 3.14)



Watch Video Solution

33. A well of diameter 3 m is dug 14 m deep. The soil taken out of it is spread evenly all around it to a width of 5 m to form an embankment. Find the height of the embankent.

Watch Video Solution

Long Answer Type Questions

1. A solid toy is in the form of a hemisphere surmounted by a right circular cone of same radius. The height of the cone is 10 Cm and the radius of the base is 7 cm. Determine the volume of the toy. Also find the area of the coloured sheet required to cover the toy. (Use $\pi = 22/7$ and $\sqrt{149} = 12.2$)

Watch Video Solution

2. A solid metalic hemisphere of radius 8 cm is melted and recast into a right circular cone of

base radius 6 cm. Determine the height of the cone.

Watch Video Solution

3. A girl empties a cylindrical bucket full of sand, of base radius 18 cm and height 32 cm on the floor to form a conical heap of sand. If the height of this conical heap is 24 cm, then find its slant height correct to one place of decimal.

Watch Video Solution

4. How many cubic centimetres of iron are there in an open box whose external dimensions are 36cm, 25cm and 16.5cm, the iron being 1.5cm thick throughout? If 1 cubic cm of iron weighs 15g, find the weight of the empty box in kg.

Watch Video Solution

5. The barrel of a fountain pen, cylindrical in shape, is 7 cm long and 5 mm in diameter. A

full barrel of ink in the pen will be used up on writing 330 words on an average. How many words would use up a bottle of ink containing one fifth of a litre ?

Watch Video Solution

6. 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 $1cm^3$ of iron has approximately 8 gm mass. (Use $\prod$ = 3.14)

Watch Video Solution

7. A solid metalic sphere, 3 cm in radius is melted and recast into three spherical balls with radii 1.5 cm, 2 cm and x cm. Find the value of x.

Watch Video Solution

8. Water flows at the rate of 10 m/min from a cylindrical pipe 5 mm in diameter. How long will it take to fill up a conical vessel whose diameter at the base is 40 cm and depth is 24 cm?

Watch Video Solution

9. The height of a cone is 30 cm .A small cone is cut off at the top by a plane parallel to the base . If its volume be $\frac{1}{27}$ of the volume of the

given cone, at what height above the base the section has been made?

Watch Video Solution

10. A factory manufactures 1,20,000 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 colouring the curved surfaces of the pencils manufactured in one day at Rs. 0.05 per dm^2.

Watch Video Solution

11. IN the centre of a rectangular lawn of dimensions $50m \times 40m$, a rectangular pond has to be cnstructed, so that the area of the grass surrounding the pond would be $1184m^2$. Find the length and breadth of the pond.

Watch Video Solution

12. 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 cm by 10 cm by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm. Find the volume o

Watch Video Solution

13. Water is flowing at the rate of 15 km/hour through a pipe of diameter 14 cm into a cuboidal pond which is 50 m long and 44 m wide. In what time will the level of water in the pond rise by 21 cm ?

Watch Video Solution

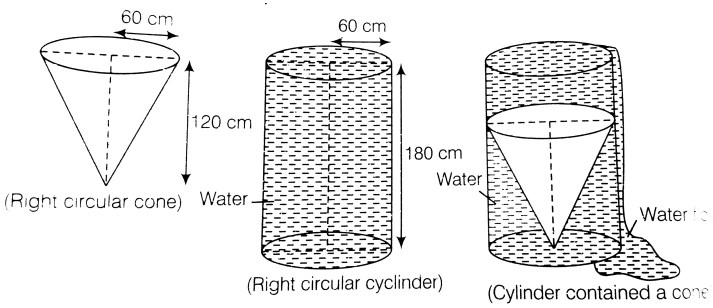
14. In a hospital used water is collected in a cylindrical tank of diameter 2 m and hight 5 m.After recycling this water is used to irrigate a park of hospital whose length is 25 m and breadth is 20 m. If tank is filled completely then what will be the height of standing water used for irigating the park write your views on recycling of water.

Watch Video Solution

15. 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 diamter and height of the cylinder are 6 cm and 12 cm , respectively. If the slant height of the conical portion is 5 cm, the find the total surface area and volume of the rocket. (use $\pi = 3.14$).

Watch Video Solution

16. A solid right circular cone of height 120 cm and radius 60 cm is placed in a right circular cylinder full of water of height 180 cm.Such that it touhces the bottom .Find the volume of water of left in the cylinder, if the radius of the cylinder is equal to the radius to the cone.



Watch Video Solution

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

Watch Video Solution

18. Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively offered to the state government to provide place and the canvas for 1500 tents to

be fixed by the government and decided to share the whole expenditure equally. The lower part of each tent is cylindrical of base radius 2.8 m and height 3.5 m, with conical upper part of same base radius but of height 2.1 m. If the canvas used to make the tents costs Rs. 120 per sq. m, find the amount shared by each school to set up the tents. What value is generated by the above problem ? (Use $\pi = \frac{22}{7}$)

Watch Video Solution

19. A 20 m deep well with diameter 7 m is dug and the earth from digging is evenly spread to form a platform of divisions 22 m $\times$ 14 m. Find the height of the platform.

Watch Video Solution

20. From each end of a solid metal cylinder, meral was scooped out in hemispherical form same diameter. The height of the cylinder is 10 cm and its base is of radius 4.2 cm. The rest the cylinder is melted and converted into a

cylindrical wire of 1.4 cm thickness. Find the length of the wire.

Watch Video Solution

21. A water flows through a cylindrical pipe, whose inner radius is 1 cm, at the rate of $80cm^{-1}$ in an empty cylindrical tank, the radius of whose base is 40 cm. What is the rise of water level in tank in half an hour?

Watch Video Solution

22. The rain water from a roof af dimensions $22m \times 20m$ drains into a cylindrical vessel having diameter of bases 2 m and height 3.5 m. If the rain water collected form the roof just fill the cylindrica vessl, them find the rainfull (in cm).

Watch Video Solution

23. Two spheres of same metal weight 1 kg and 7 kg. The radius of the smaller sphere is 3 cm. The two spheres are melted to form a single

big sphere. Find the diameter of the new sphere.

Watch Video Solution

24. 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,

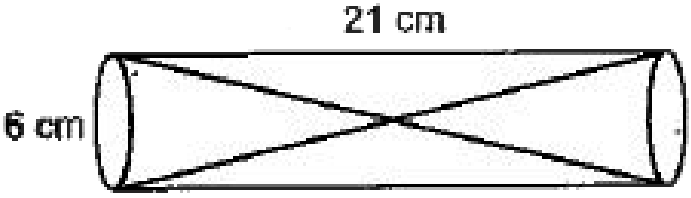
Watch Video Solution

25. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in her field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/h, in how much time will the tank be filled?

Watch Video Solution

26. Two solid cones A and B are placed in a cylindrical tube as shown in the given figure.

The ratio of their capacities are 2 : 1. Find the heights and capacities of the cones. Also, find the volume of the remaining portion of the cylinder.



Watch Video Solution

27. Water is flowing at the rate of 5 km/hour through a pipe of diameter 14 cm into a tank

with rectangular base which is 50 m long and 44 m wide. Find the time in which the level of water tank rises by 7 cm. (Use $\pi = \frac{22}{7}$)

Watch Video Solution

28. A wall 24 m long, 0.4 m thick and 6 m high is constructed with the bricks each of dimension $25cm \times 16cm \times 10cm$. If the mortar occupies $\frac{1}{10}th$ of the volume of the wall then find the number of bricks used in constructing the well.

Watch Video Solution

29. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?

Watch Video Solution

30. A cone of maximum size is carved out from a solid cube of side 14 cm. Find the total surface area of the remaining solid left out.

Watch Video Solution