MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

MENSURATION

Progress Check

1. Right circular cone is a solid obtained by revolving .... about ....

2. In a right circular cylinder the axis is .... to the diameter.

3. The difference between the C.S.A and TSA of a right circular cylinder is ___.

4. The C.S.A of a right circular cylinder of equal radius and height is .... the area of its base.

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5. Right circular cone is a solid obtained by revolving .... about ....

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6. In a right circular cone the axis is ____ to the diameter..

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7. The difference between the CSA and TSA of a cone is ___.

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8. When a sector of a circle is transformed to form a cone, then match the conversions talking place between the sector and the cone.

Sector	Cone
Radius	Circumference of the base
Area	Slant height
Arc length	Curved surface area

9. Every section of a sphere by a plane is a ....

10. The centre of a great circle is at the ____ of a sphere.

11. The difference between TSA and CSA of hemisphere is ____.

12. The ratio of following area of a sphere and CSA of hemisphere is ___.

13. A section of the sphere by a plane through any of its great circle is ____.

14. The portion of a right circular cone intersected between two parallel planes is ....

15. How many frustums can a right circular cone have?

16. Volume of a cone is the product of its base area and ....

17. If the radius of the cone is doubled, the new volume will be .... times the original volume.

18. Consider the cones given in figure.
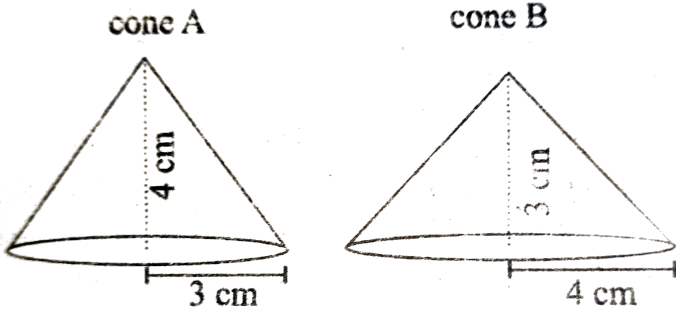
(i) Without doing any calculation, find out whose volume is greater?

19. What is the ratio of volume to surface area of sphere?

20. The relationship between the height and radius of the hemisphere is ____.

21. The volume of a sphere is the product of its surface area and ....

1. The radius and height of a cylinder are in the ratio 5 : 7 and its curved surface area is 5500 sq. cm. Find its radius and height.

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2. A solid iron cylinder has total surface area of 1848 sq.m. Its curved surface area is five -sixth of its total surface area. Find the radius and height of the iron cylinder.

3. The external radius and the length of a hollow wooden log are 16 cm and 13 cm respectively. If its thickness is 4 cm then find its T.S.A.

4. A right angled triangle PQR where $\angle Q = 90°$ is rotated about QR and PQ. If

QR=16 cm and PR=20 cm, compare the curved surface areas of the right circular cones so formed by the triangle.

5. 4 person live in a conical tent whose slant height is 19 cm. If each person require $22cm^2$ of the floor area, then find the height of the tent.

6. A girl wishes to prepare birthday caps in the form of right circular cones for her birthday party, using a sheet of paper whose area is $5720cm^2$, how many caps can be made with radius 5 cm and height 12 cm.

7. The ratio of the radii of two right circular cones of same height is 1 : 3. Find the ratio of their curved surface area when the height of

each cone is 3 times the radius of the smaller cone.

**8.** The radius of a sphere increases by 25% . Find the percentage increase in its surface area.

9. The internal and external diameters of a hollow hemispherical vessel are 20 cm and 28 cm respectively. Find the cost to paint the vessel all over at Rs. 0.14 per cm^2.

10. The frustum shaped outer portion of the table lamp has to be painted including the top part. Find the total cost of painting the lamp if

the cost of painting 1 sq. cm is Rs. 2.

6 m

8 m

12 m
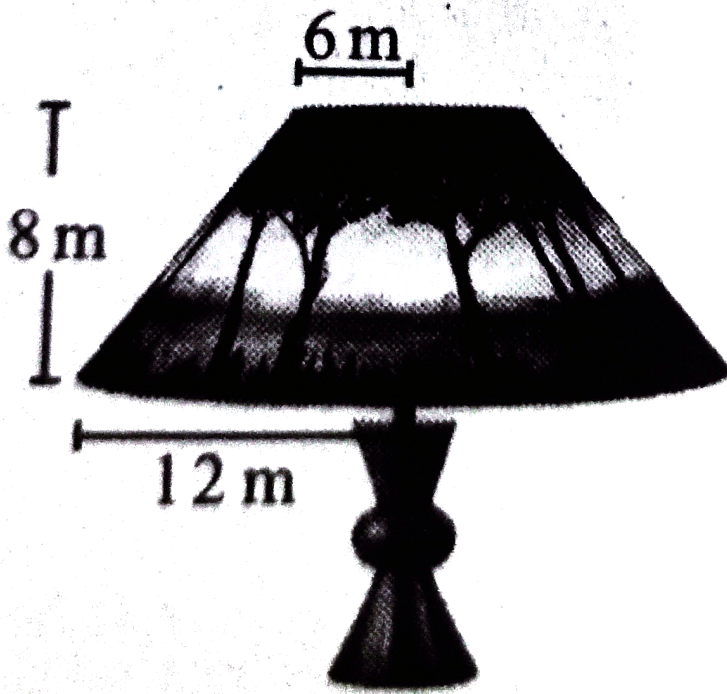
Exercise 7 2

1. A 14 m deep well with inner diameter 10 m is dug and the earth taken out is evenly spread all around the well to form an embankment of width 5 m. Find the height of the embankment.

2. A cylindrical glass with diameter 20 cm has water to a height of 9 cm. A small cylindrical metal of radius 5 cm and height 4 cm is

immersed it completely. Calculate the raise of the water in the glass ?

3. If the circumference of a conical wooden plece is 484 cm then find its volume when its height is 105 cm.

4. A conical container is fully filled with petrol. The radius is 10 m and the height is 15 m. If the container can release the petrol through its bottom at the rate of 25 cu. Meter per minute, in how many minutes the container will be emptied. Round off your answer to the nearest minute.

5. A right angled triangle whose sides are 6 cm, 8 cm and 10 cm is revolved about the sides containing the right angle in two ways. Find the difference in volumes of the two soilds so formed.

6. The volumes of two cones of same base radius are $3600 cm^3$ and $5040 cm^3$. Find the ratio of heights.

7. If the ratio of radii of two speres is 4 : 7 , find the ratio of their volumes.

8. A solid sphere and a sloid hemisphere have equal total surface area. Prove that the ratio of their volume is $3\sqrt{3}:4.$

9. The outer and the inner surface areas of a spherical copper shell are $576\pi cm^2$ and $324\pi cm^2$ respectively. Find the volume of the material required to make the shell.

10. A container open at the top is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends are 8 cm and

20 cm respectively. Find the cost of milk which can completely fill a container at the rate of Rs. 40 per litre.

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Exercise 7 3

1. A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter is 14 cm and the height of the vessel is 13 cm. Find the capacity of the vessel.

2. Nathan, an engineering student was asked to make a model shaped like a cylinder with two cones attached at its two ends. The diameter of the model is 3 cm and its length is 12 cm. If each cone has a height of 2 cm, find the volume of the model that Nathan made.

3. From a solid cylinder whose height is 2.4 cm and the diameter 1.4 cm, a cone of the same height and same diameter is carved out. Find the volume of the remaining solid to the nearest cm^3.
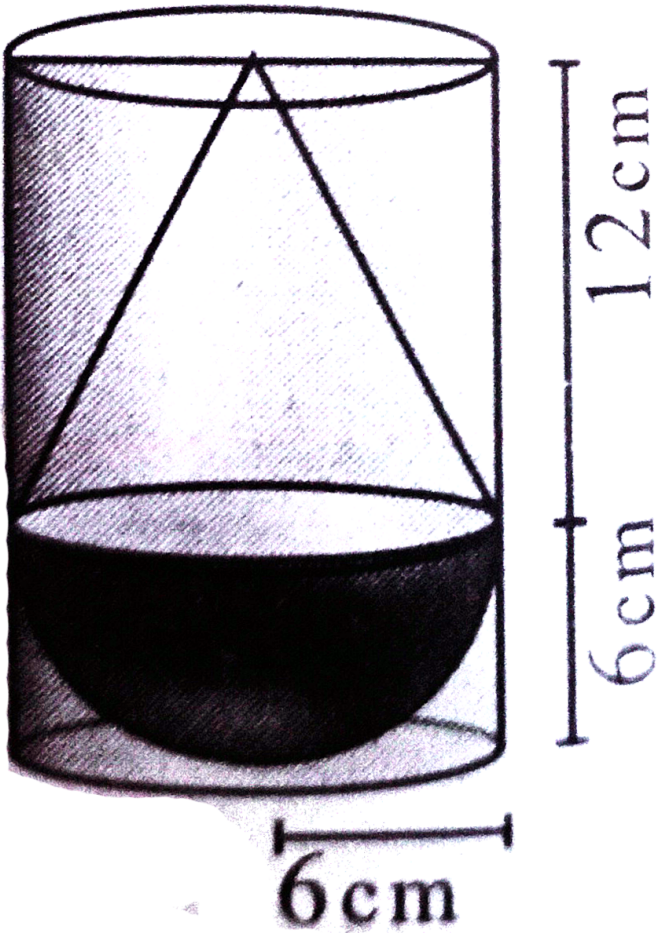
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4. A solid consisting of a right circular cone of height 12 cm and radius 6 cm standing on a hemisphere of radius 6 cm is placed upright in

a right circular cylinder full of water such that it touches the bottom. Find the volume of the water displaced out of the cylinder, if the radius of the cylinder is 6 cm and height is 18

cm.

12 cm

6 cm

6cm

5. A capsule is in the shape of a cylinder with two hemisphere stuck to each of tis ends. If the length of the entire capsule is 12 mm and the diameter of the capsule is 3 mm, how much medicine it can hold ?

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6. As shown in figure a cubical block of side 7 cm is surmounted by a hemisphere. Find the

surface area of the solid.

.7 cm
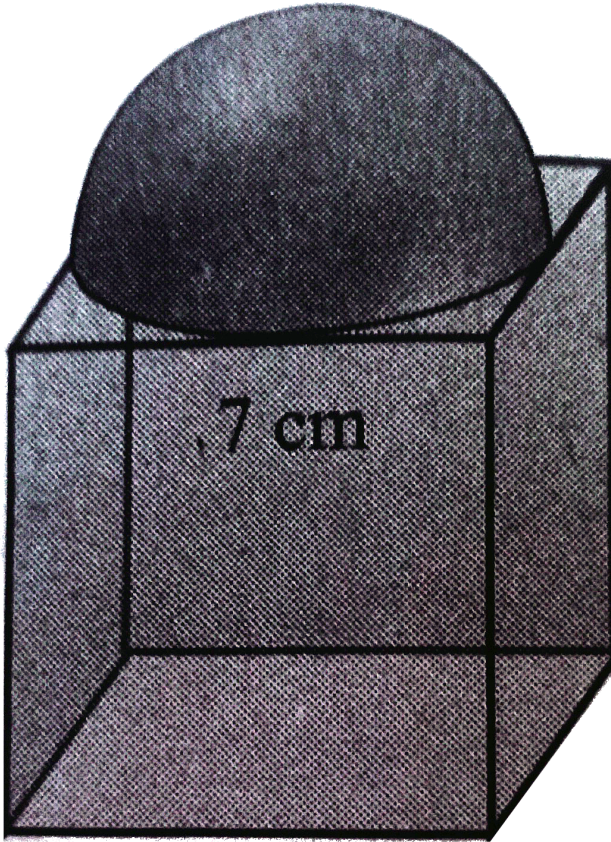
7. A right circular cylinder just enclose a sphere of radius r units.

Calculate

(i) the surface area of the sphere

(ii) the curved surface area of the cylinder

(iii) the ratio of the areas obtained in (i) and (ii).

8. A shuttle cock used for playing badminton has the shape of a frustum of a cone is mounted on a hemisphere. The diameters of the frustum are 5 cm and 2 cm. The height of the entire shuttle cock is 7 cm. Find its external surface area.

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Exercise 7 4

1. An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the cylinder.

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2. 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 tanks will rise by 21 cm.

3. A conical flask is full of water. The flask has base radius r units and height h units, the water pured into a cylindrical flask of base radius xr units. Find the height of water in the cylindrical flask.

4. A solid right circular cone of diameter 14 cm and height 8 cm is melted to form a hollow

sphere. If the external diameter of the spere is 10 cm, find the internal diameter.

5. Seenu's house has an overhead tank in the shape of a cylinder. This is filled by pumping water froma sump (underground tank) which is in the shape of a cuboid. The sump has dimensions $2m \times 1.5m \times 1m$. The overhead tank has its radius of 60 cm and height 105 cm. Find the volume of the water left in the sump

after the overhead tank has been completely filled with water from the sump which has been full, initially.

6. The internal and external diameter of a hollow hemispherical shell are 6 cm and 10 cm respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, then find the height of the cylinder.

7. A solid sphere of radius 6 cm is melted into a hollow cylinder of uniform thickness. If the external radius of the base of the cylinder is 5 cm and its height is 32 cm, then find the thickness of the cylinder.

8. A hemispherical bowl is filled to the brim with juice. The juice is poured into a cylindrical vessel whose radius is 50% more than its

height. If the diameter is same for both the bowl and the cylinder then find the percentage of juice that can be transferred from the bowl into the cylindrical vessel.

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Exercise 7 5

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

A. $60\pi cm^2$

B. $68\pi cm^2$

C. $120\pi cm^2$

D. $136\pi cm^2$

Answer: D

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2. If two solid hemispheres of same base radius r units are joined together along their

bases, then curved surface area of this new

solid is

A. $4\pi r^2 \, sq. \, units$

B. $6\pi r^2 \, sq. \, units$

C. $3\pi r^2 \, sq. \, units$

D. $8\pi r^2 \, sq. \, units$

Answer: A

3. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be

    A. 12cm

    B. 10cm

    C. 13cm

    D. 5cm

Answer: A

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4. If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is

A. $1:2$

B. $1:4$

C. $1:6$

D. $1:8$

Answer: B

5. The total surface area of a cylinder whose radius is $\dfrac{1}{3}$ of its height is

A. $\dfrac{9\pi h^2}{8}$ sq. units

B. $24\pi h^2$ sq. units

C. $\dfrac{8\pi h^2}{9}$ sq. units

D. $\dfrac{56\pi h^2}{9}$ sq. units

Answer: C

6. In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is

A. $560\pi cm^2$

B. $1120\pi cm^3$

C. 56π

D. 360π

Answer: B

7. If the radius of the base of a cone is tripled and the height is doubled then the volume is

    A. made 6 times

    B. made 18 times

    C. made 12 times

    D. unchanged

Answer: B

▶

8. The total surface area of a hemi-sphere is how much times the square of its radius.

A. π

B. 4π

C. 3π

D. 2π

Answer: C

9. A solid sphere of radius x cm is melted and cast into a shape of a solid cone of same radius. The height of the cone is

    A. $3x$cm

    B. $x$cm

    C. $4x$cm

    D. $2x$cm

Answer: C

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10. A frustum of a right circular cone is of height 16 cm with radii of its ends as 8 cm and 20 cm. Then, the voume of the frustum is

    A. $3328\pi cm^3$

    B. $3228\pi cm^3$

    C. $3240\pi cm^3$

    D. $3340\pi cm^3$

Answer: A

11. A shuttle cock used for playing badminton has the shape of the combination of

A. a cylinder and a sphere

B. a hemisphere and a cone

C. a sphere and a cone

D. frustum of a cone and a hemisphere

Answer: D

12. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1 : r_2$ is

    A. $2 : 1$

    B. $1 : 2$

    C. $4 : 1$

    D. $1 : 4$

Answer: A

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13. The volume (in cm^3) of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is

A. $\dfrac{4}{3}\pi$

B. $\dfrac{10}{3}\pi$

C. 5π

D. $\dfrac{20}{3}\pi$

Answer: A

14. The height and radius of the cone of which the frustum is a part are h^1 units and r_1 units respectively. Height of the frustum is h_2 units and radius of the smaller base is r_2 units. If $h_2 : h_1 = 1 : 2$ then $r_2 : r_1$ is

    A. $1 : 3$

    B. $1 : 2$

    C. $2 : 1$

    D. $3 : 1$

Answer: B

15. The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is

    A. $1:2:3$

    B. $2:1:3$

    C. $1:3:2$

    D. $3:1:2$

Answer: D

Unit Exercise

1. The barrel of a fountain-pen cylindrical in shape, is 7 cm long and 5 cm in diameter. A full barrel of ink in the pen will be used for writing 330 words on an average. How many words can be written using a bottle of ink containing one fifth of a litre ?

2. A hemi-spherical tank of radius 1.75 m is full of water. It is connected with a pipe which empties the tank at the rate of 7 litre per second. How much time will it take to empty the tank completely ?

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

4. An oil funnel of tin sheet consists of a cylindrical portion 10 cm long attached to a frustum of a cone. If the total height is 22 cm, the diameter of the cylindrical portion be 8 cm and the diameter of the top of the funnel be

18 cm, then find the area of the tin sheet required to make the funnel.

5. Find the number of coins, 1.5 cm in diameter and 2 mm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.

6. A hollow metallic cylinder whose external radius is 4.3 cm and internal radius is 1.1 cm and whole length is 4 cm is melted and recast into a solid cylinder of 12 cm long. Find the diameter of solid cylinder.

7. The slant height of a frustum of a cone is 4 m and the perimeter of circular ends are 18 m

and 16 m. Find the cost of painting its curved surface area at Rs 100 per sq. m.

8. A hemi-spherical hollow bowl has material of volume $\dfrac{436\pi}{3}$ cubic cm. Its external diameter is 14 cm. Find its thickness.

9. The volume of a cone is $1005\dfrac{5}{7}$ cu. Cm. The area of its base is $201\dfrac{1}{7}$ sq. cm. Find the slant height of the cone.

10. A metallic sheet in the form of a sector of a circle of radius 21 cm has central angle of $216°$. The sector is made into a cone by bringing the bounding radii together. Find the volume of the cone formed.

Additional Questions Solved

1. The curved surface area of a right circular cylinder of radius 1cm and height 1cm is equal to ....

A. πcm^2

B. $2\pi cm^2$

C. $3\pi cm^2$

D. $2cm^2$

Answer: B

2. The total surface area of a solid right circular cylinder whose radius is helf of its height h is equal of .... Sq.units.

A. $\dfrac{3}{2}\pi h$

B. $\dfrac{2}{3}\pi h^2$

C. $\dfrac{3}{2}\pi h^2$

D. $\dfrac{2}{3}\pi h$

Answer: C

3. Base area of a right circular cylinder is $80cm^2$. If its height is 5 cm, then the volume is equal to ....

    A. $400cm^3$

    B. $16cm^3$

    C. $200cm^3$

    D. $\dfrac{400}{3}cm^3$

Answer: A

4. If the total surface area of a solid right circular cylinder is $200\pi cm^2$ and its radius is 5 cm, then the sum of its height and radius is ....

A. 20cm

B. 25cm

C. 30cm

D. 15cm

Answer: A

5. The curved area of a right circular cylinder whose radius is a units and height is b units, is equal to ....

A. $\pi a^2 b \, sq. \, cm$

B. $2\pi a b \, sq. \, cm$

C. $2\pi sq.\ cm$

D. $2 sq.\ cm$

Answer: B

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6. Radius and height of a right circular cone and that of a right circular cylinder are respectively, equal. If the volume of the cylinder is $120 cm^3$, then the volume of the cone is equal to ………. .

A. $1200 cm^3$

B. $360 cm^3$

C. $40 cm^3$

D. $90 cm^3$

Answer: C

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7. If the diameter and height of a right circular

cone are 12 cm and 8 cm respectively, then the

slant height is ....

A. 10cm

B. 20cm

C. 30cm

D. 96cm

Answer: A

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8. If the circumference at the base of a right circular cone and the slant height are 120πcm

and 10cm respectively, then the curved suface area equal to ....

A. $1200\pi cm^2$

B. $600\pi cm^2$

C. $300\pi cm^2$

D. $300 cm^2$

Answer: B

9. If the volume and the base area of a right circular cone are $48\pi cm^3$ and $12\pi cm^2$ respectively, then the height of the cone is equal to ....

   A. 6cm

   B. 8cm

   C. 10cm

   D. 12cm

Answer: D

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10. If the height and the base area of a right circular cone are 5cm and 48sq.cm respectively. Then the volume of the cone is equal to......... .

    A. $240 cm^3$

    B. $120 cm^3$

    C. $80 cm^3$

    D. $480 cm^3$

Answer: C

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11. The ratios of the respective height and the respective radii of two cylinder are $1:2$ and $2:1$ respectively. Then their respective volumes are in the ratio ....

   A. $4:1$

   B. $1:4$

   C. $2:1$

D. $1:2$

Answer: C

12. If the radius of a sphere is 2cm, then the curved surface area of the sphere is equal to ....

A. $8\pi cm^2$

B. $16cm^2$

C. $12\pi cm^2$

D. $16\pi cm^2$

Answer: D

13. The total surface area of a solid hemisphere of diameter 2cm is equal to ....

A. $12cm^2$

B. $12\pi cm^2$

C. $4\pi cm^2$

D. $3\pi cm^2$

Answer: D

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14. If the volume of a sphere is $\dfrac{9}{6}\pi cu.\ cm$ then its radius is ....

A. $\dfrac{4}{3}cm$

B. $\dfrac{3}{4}cm$

C. $\dfrac{3}{2} cm$

D. $\dfrac{2}{3} cm$

Answer: B

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15. The surface area of two sphere are in the ratio of $9:25$ then their volume are in the ratio ....

A. $81:625$

B. $729 : 15625$

C. $27 : 75$

D. $27 : 125$

Answer: D

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16. The total surface area of a solid hemisphere whose radius is a units, is equal to ....

A. $2\pi a^2$ sq. units

B. $3\pi a^2$ sq. units

C. $3\pi a$ sq. units

D. $3a^2$ sq. units

Answer: B

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17. If the surface area of a sphere is $100\pi cm^2$, then its radius is equal to ....

A. 25 cm

B. 100 cm

C. 5 cm

D. 10 cm

Answer: C

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18. If the surface area of a sphere is $36\pi cm^2$, then the volume of the sphere is equal to ....

A. $12\pi cm^3$

B. $36\pi cm^3$

C. $72\pi cm^3$

D. $108\pi cm^3$

Answer: B

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19. If the total surface area of a solid hemisphere is $12\pi cm^2$ then its curved surface area is equal to ....

A. $6\pi cm^2$

B. $24\pi cm^2$

C. $36\pi cm^2$

D. $8\pi cm^2$

Answer: D

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20. If the radius of a sphere is half of the radius of another sphere, then their respective volumes are in the ratio ....

A. $1:8$

B. $2:1$

C. $1:2$

D. $8:1$

Answer: A

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21. Curved surface area of a solid sphere is $24cm^2$. If the the sphere is divided into two

hemisphere, then the total surface area of one of the hemisphere is ....

A. $12cm^2$

B. $8cm^2$

C. $16cm^2$

D. $18cm^2$

Answer: D

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22. Two right circular cones have equal radii. If their slant height are in the ratio $4:3$, then their respective curved surface areas are in the ratio ....

A. $16:9$

B. $2:3$

C. $4:3$

D. $3:4$

Answer: C

23. If a rectangle of length 8 cm breadth 4 cm is folded by bringing their breadths together to form a cylinder, then the height of the cylinder thus formed is ....

A. 6 cm

B. 2 cm

C. 8 cm

D. 4 cm

Answer: D

24. The number of solid spheres, each of diameter 6 cm that can be made by melting a solid metal cylinder. It height 45 cm and diameter 4 cm is ....

   A. 3

   B. 4

   C. 5

D. 6

Answer: C

25. A rectangular sheet of paper $40cm \times 22cm$ is rolled to form a hollow cylinder of height 40 cm. The radius of the cylinder (in cm) is ....

A. 3.5 cm

B. 7 cm

C. $\dfrac{80}{7} cm$

D. 5 cm

Answer: A

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Additional Questions Solved Ii

1. A mansion has 12 right cylindrical pillars each having radius 50 cm and height 3.5m.

Find the cost to painting the surface of the pillares at Rs 20 per square metre.

2. The total surface area of a solid right circular cylinder is $1540 cm^2$. If the height is four times the radius of the base, then find the height of the cylinder.

3. The central angle and radius of a sector of a circular disc are $180°$ and 21 cm respectively. If the edges of the sector are joined together to make a hollow cone, then find the radius of the cone.

4. If the curved surface area of a solid hemisphere is 2772 sq.cm, then find its total surface area.

5. A inner curved surface area of a hemispherical dome of a building needs to be painted. If the circumference of the base is 17.6m, find the cost of painting it at the rate of Rs 5 per sq.m.

6. Volume of a solid cylinder is $62.37 cu cm.$ Find the radius if its height is 4.5cm.

7. A rectangular sheet of metal foil with dimension $66cm \times 12cm$ is rolled to form of a cylinder of height 12cm. Find the volume of the cylinder.

8. The circumference of the base of a 12m high wooden solid cone is 44m. Find the volume.

9. Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 14 cm.

10. The thickness of a hemispherical bowl is 0.25cm. The inner radius of the bowl is 5cm. Fiind the outer curved surface area of the bowl.(Take $\pi = \dfrac{22}{7}$)

11. A right circular cylinder just enclose a sphere of radius r units.

Calculate

(i) the surface area of the sphere

(ii) the curved surface area of the cylinder

(iii) the ratio of the areas obtained in (i) and (ii).

12. A shopkeeper has one spherical laddoo of radius 5cm. Which the same amount of meterial. How many laddoos of radius 2.5cm can be made?

13. The radii of the bases of two right circular solid cones of same height are r_1 and r_2 respectively. The cones are melted and recast into a solid sphere of Radius "R" show the height of the cone is given by $h = \dfrac{4R^3}{r_1^2 + r_2^2}$

14. The radius and height of a cylinder are in the ratio $2 : 7$. If the curved surface area of the cylinder is 352 sq.cm. Find its radius.

Additional Questions Solved Iii

1. A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter is 14 cm and the height of the vessel is 13 cm. Find the capacity of the vessel.

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2. A medicine capsule is in the shape of a cylinder with two hemisphere struck to each of its ends. The length of the entire capsule is 14

mm and the diameter of the capsule is 5 mm.

Find its surface area

3. From a solid cylinder whose height is 2.4 cm

and the diameter 1.4 cm, a cone of the same

height and same diameter is carved out. Find

the volume of the remaining solid to the

nearest cm^3.

4. A 20m deep well with distance 7m is dug and the earth from digging is evenly spread out to form a platform 22 m by 14 m. Find the height of the platform.

5. The perimeters of the ends of frustum of a cone are 207.24cm nd 169.56cm. If the height of the frustum be 8 cm, find the whole surface area of the frustum. [Use $\pi = 3.14$]

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

7. The perimeters of the ends of a frustum of a cone are 44 cm and $8.4\pi cm$. If the depth is 14 cm., then find its volume.

8. A tent is in the shape of a right circular cylinder surmounted by a cone. The total height and the diameter of the base are 13.5m and 28m. If the height of th cylindrical portion is 3m, Find the total surface area of the tent.