MATHS

BOOKS - CALCUTTA BOOK HOUSE

MATHS (BENGALI ENGLISH)

RIGHT CIRCULAR CYLINDER

Example Very Short Answer Type Questions A Multiple Choice Questions Mcq

1. If the length of the radii of two solid right circular cylinder are in the ratio 2:3 and their heights are in the ratio 5:3 , then the ratio of their lateral surfaces is

A. $2:5$

B. $8:7$

C. $10:9$

D. $16:9$

Answer: C

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2. If the length of the radii of two solid right circular cylinder are in the ratio 2:3 and their height are in the ratio 5:3 , then the ratio of their volumes is

A. $27:20$

B. $20:27$

C. $4:9$

D. $9:4$

Answer: B

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3. If volumes of two solid right circular cylinders are same and their heights are in the ratio 1:2, then the ratio of lengths of their radii is -

A. $1:\sqrt{2}$

B. $\sqrt{2}:1$

C. $1:2$

D. $2:1$

Answer: B

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4. In a right circular cylinder, if the length of radius is halved and height is doubled, then the volume of cylinder will be

A. equal

B. double

C. half

D. 4 times

Answer: C

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5. If the length of the radius of a right circular cylinder is doubled and height is halved, then its lateral surface area will be

A. equal

B. double

C. half

D. 3 times

Answer: A

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Example B Write True Of False

1. The length of radius of right circular drum is r cm and height is h cm. If half part of the

drum is filled with water, then the volume of water will be $\pi r^2 h$ cubic-cm. TRUE of FALSE

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2. If the length of radius of a right circular cylinder is 2 units, then the numerical value of volume and surface area of cylinder will be equal for any height .

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Example C Fill In Blanks

1. The length of a rectangular paper is l units and breadth is b units. The rectangular paper is rolled and a cylinder is formed of which perimeter is equal to the length of the paper. The lateral surface area of the cylinder is _____ sq-unit.

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2. The longest rod that can be kept in a right circular cylinder having the diameter of 3 cm and height of 4 cm, then the length of rod is _____ cm.

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3. If the numerical values of volume and lateral surface area of a right circular cylinder are equal, then the length of diameter of cylinder is _____ unit.

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Example Short Answer Type Questions

1. If the lateral surface area of a right circular cylindrical pillar is 264 sq-metres and volume is 924 cubic-metres. Find the length of radius of the base of the cylinder.

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2. If the lateral surface area of a right circular cylinder is c. square unit, length of radius of base is r unit and volume is V cubic-unit. Find the value of $c\frac{r}{V}$.

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3. If the height of a right circular cylinder is 14 cm and lateral surface area is 264 sq-cm, find the volume of the cylinder.

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4. If the height of two right circular cylinder are in the ratio of 1:2 and perimeters are in the ratio 3:4 . Find the ratio of their volumes.

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5. The length of radius of a right circular cylinder is decreased by 50% and height is increased by 50% . Calculate how much percent of the volume will be changed.

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Example Long Answer Type Questions

1. Calculate how many cubic decimetre of concrete materials will be needed to construct two cylindrical pillars each of whose diameter is $5 \cdot 6$ decimetres and height is $2 \cdot 5$ metres. Calculate the cost of plastering the curved surface area of the two pillars at Rs. 125 per sq-metres.

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2. Out of three jars of equal diameter and height, $\frac{2}{3}$ part of the first, $\frac{5}{6}$ part of the second and $\frac{7}{9}$ part of the third were filled with dilute sulphuric acid. Whole of acid in the three jars were poured into a large jar of $2 \cdot 1$ dcm diameter, as a result the height of acid in the jar becomes $4 \cdot 1$ dcm. If the length of diameter of each of the three equal jars is $1 \cdot 4$ dcm. Calculate the height of three jars.

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3. If a pump set with a pipe of 14 cm diameter can drain 2500 metres water per minute, then calculate how much kilolitres water will that pump drain per hour. [1 litre = 1 cubic dcm]

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4. There are some water in a long gas jar of 7 cm diameter. If a solid right circular cylindrical pipe of iron having 5 cm length and $5 \cdot 6$ cm diameter be immersed completely in that

water, calculate how much the level of water will rise.

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5. If the surface area of a right circular cylindrical pillar is 264 sq-metres and volume is 396 cubic-metres, then calculate height and length of diameter of this pillar.

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6. A right circular cylindrical tank of 9 metres height is filled with water. Water comes out from there through a pipe having length of 6 cm diameter with a speed of 225 metre per minute and the tank becomes empty after 2 hours 24 minutes. Calculate the length of radius of the tank.

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7. Curved surface area of a right circular cylindrical log of wood of uniform density is 440 sq · dcm. If 1 cubic dcm of wood weight $1 \cdot 5$ kg and weight of the log is $9 \cdot 24$ quintals, then calculate the length of diameter of log and its height.

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8. The length of inner and outer diameter of a right circular cylindrical pipe open at two ends

are 30 cm and 26 cm respectively and length of pipe is $14 \cdot 7$ metres. Calculate the dost of painting its all surfaces with coaltar at Rs. $2 \cdot 25$ per sq-dcm.

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9. Height of a hollow right circular cylinder, open at both ends, is $2 \cdot 8$ metres. If length of inner diameter of the cylinder is $4 \cdot 6$ dcm and the cylinder is made up of $84 \cdot 48$ cubic-dcm of

iron, then calculate the length of outer diameter of the cylinder.

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10. Height of a right circular cylinder is twice of its radius. If the height would be 6 times of its radius, then the volume of the cylinder would be greater by 4312 cubic.dcm. Calculate the radius of the cylinder.

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11. A group of fire brigade personnel carried a right circular cylindrical tank filled with water and pumped out water at a speed of 420 metres per minute to put the fire in 40 minutes by three pipes of 2 cm diameter each. If the diameter of the tank is $2 \cdot 8$ metres and its length is 6 metre, then calculate (a) what volume of water has been spent in putting out the fire and (b) hte volume of water that still remains in the tank .

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12. It is required to make a plastering of sand and cement with $3 \cdot 5$ cm thick, surrounding four cylindrical pillars, each of whose diameter is $17 \cdot 5$ cm. and height 3 m.

If the ratio of sand and cement in the plaster material be $4 : 1$, then how many cubic, dcm of cement will be needed ?

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13. The length of outer and innner diameter of a hollow right circular cylinder are 16 cm and

12 cm respectively and height of cylinder is 36 cm. how many solid cylinders of 2 cm radius and 6 cm length may be obtained by melting this cylinder.

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14. 11 cubic centimetres of iron is drawn into a wire of 56 cm long. Find the radius of the end of the wire.

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15. The upper portion of a cylindrical pillar is a hemisphere. If the radius of its base is 2 metres and its total length is 10 metres. Find out the volume of the pillar.

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Exercise 2 Very Short Answer Types Questions A Multiple Choice Questions Mcq

1. The height of a right circular cylinder is 1 m 4 dcm and the diameter of the base is 5

metres. Then the area of the curved surface of the cylinder is

A. 20 sq-m

B. 21 sq-m

C. 22 sq-m

D. 23 sq-m

Answer: C

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2. If the external radius of a hollow cylinder be R units, the internal radius be r units and the height be h units, then the volume of the cylinder is

A. $\pi h\left(R^2 - r^2\right)$ sq-units

B. $\pi h\left(R^2 - r^2\right)$ cu - units

C. $\pi\left(R^2 + r^2\right)$ cu-units

D. $\pi h\left(R^2 + r^2\right)$ cu-units

Answer: B

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3. If the radius of the base of a cylinder be r units and the height of the cylinder be h units, then the total surface area of the cylinder is

A. $2\pi(h+r)$ sq-units

B. $2h(\pi+r)$ sq-units

C. $2\pi rh$ sq-units

D. $2\pi r(h+r)$ sq-units

Answer: D

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4. If volume of two solid right cylinder are same and their height are in the ratio 2:1 , then the ratio of lengths of radii is

A. $1:\sqrt{2}$

B. $\sqrt{2}:1$

C. $1:2$

D. $2:1$

Answer: A

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Exercise 2 B Write True Of False

1. The total surface area of a hollow right circular cylinder $= 2\pi\left(Rh + rh + R^2 - r^2\right)$ sq-units, where R = outer radius, r = inner radius and h = height of the cylinder. TRUE or FALSE

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2. The volume of a right circular cylinder is $2\pi rh$ sq- units, where r = radius of the base and h = height of the cylinder.

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Exercise 2 C Fill In Blanks

1. If the current surface of a cylindrical column of height 8 metres is 2464 square-metres, then the radius of the base is _____ .

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2. If the total surface area of a cylindrical pot open at one end is 1474 sq-cm . Then the height of the pot is equal to _____ cm.

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3. If the height of the cylindrical part of a hemisphere is equal to the radius of the semi-circle of it, then the total volume of the hemisphere is equal to _____ cubic-units.

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Exercise 2 Short Answer Type Questions

1. The diameter of a right-circular cylinder of height 14 metres is 6 metres. Find its volume.

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2. The diameter of the ends of a right circular cylinder is 2m 8 dcm. Find the area of its two ends.

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3. The height of a right circular cylinder is 12 cm and the diameter of the base is 7 cm. Find the area of its total surface.

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4. The height of a right circular cylinder is 4 metres and the radius of its base is 3 metres. Find the area of its curved surface.

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Exercise 2 Long Answer Type Questions

1. A hollow cylindrical pipe open at two ends is made of iron and its thickness is 2 cm. If the external diameter of the pipe be 50 cm and length be 140 cm, how many cubic centimetres of iron does it contain ?

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2. The length of a hollow right circular cylinder is 10 metres and the diameter of the base is 7 metres. Find the area of its curved surface.

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3. A pipe of diameter 7 cm is connected with a cylindrical tank of oil which is 10.5 metres long. If oil is drawn out at the rate of 210 metres per minute through the pipe, the tank full of oil

becomes empty in 45 minutes. Find the diameter of the tank.

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4. A cylindrical wooden log of $12\sqrt{2}$ m diameter and 21 metres long is taken to make it a rectangular parallelopiped shape having a square cross section. If minimum wood is lost find how much wood will be there and what is the loss ?

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5. The diameter of the base of a cylindrical pillar is 4 m and its height is 21 metres. Find the cost of constructing the pillar at Rs. $1\frac{2}{3}$ per cubic-metre.

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6. If it costs Rs. 41.25 to polish the curved surface of a cylindrical pillar of height 15 metres at the rate of 25 paise per square-metre, then find the radius of its base.

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7. The external and internal radii of a hollow cylinder of height 11.5 cm are 5.3 cm and 3.8 cm respectively. It is melted and turned into a solid cylinder of height 7.3 cm . Find the radius of the latter in nearest milimetres.

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8. A long jar of diameter 7 cm contains some water. An iron-cylinder of diameter 5.6 cm and of length 5 cm is completely immersed in its water. How much water-level will be raised in the cylinder ?

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9. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the

total height of the vessel is 13 cm. Find the inner surface area of the vessel.

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10. Rahamal got a playing top (lattu) as his birthday presentation, which surprisingly had no colour on it. So he wanted to colour it with his crayons. The top is shaped like a cone surprisingly by a hemisphere. The entire top is 5 cm in height and the diameter of the top is 3.5 cm. Find the area he has to colour.

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11. The radii of the two ends of a pail of height 24 cm are 15 cm and 5 cm . Find the volume of the pail .

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