MATHS

BOOKS - S CHAND IIT JEE FOUNDATION

VOLUME AND SURFACE AREA

Solved Examples

1. A roller of diameter 70 cm and length 2 m is rolling on the ground. What is the area

covered by the roller in 50 revolutions ?

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2. The circumference of the base of a circular cylinder is 6π cm. The height of the cylinder equal to the diameter of the base. How many litres of water can it hold?

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3. Two cylinddrical pots contain the same amount of water if their diameter are in the ratio $2:3$ then what is the ratio of their heights ?

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4. The ratio between the radius of the base and height of the cylinder is $2:3$ If the volume is $12936 \ \ \mathrm{cm}^3$, what is the total surface area of the cylinder ?

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5. The ratio of the total surface area to the lateral surface area of the cylinder is $5:3$ Find the height of the cylinder if the radius of the cylinder is 12 cm ?

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6. A slab of ice 8 inches in length, 11 inches in breadth and 2 inches thick was melted and resolidified in the form of a rod of 8 inches

diameter. What is the length of such a rod in inches ?

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7. If a solid right circular cylinder made of iron is heated to increase its radius and height by 1% each, then by how much per cent is the volume of the solid increased ?

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8. A lead pencil it is the shape of a cylinder. The pencil is 21 cm long with radius 0.4 cm and its lead is of radius 0.1 cm. What is the volume of wood in the pencil ?

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9. The lateral surface area of a hollow cylinder is $5632 \ \ \mathrm{cm}^2$. If is cut along its height and a rectangular sheet of width 44 cm is formed .Find the perimeter of the rectangular sheet ?

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10. Water flows through a cylindrical pipe of internal diameter 7 cm at 2 m per second. If the pipe is always half full, then what is the volume of water (in litres) discharged in 10 minutes? (a) 2310 (b) 3850 (c) 4620 (d) 9240

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11. A soft drink can has a circular base diameter 7 cm and height 12 cm. A powder tin

has a square base with side 7 cm and height 12 cm. What is the difference in their capacities ?

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12. The trunk of a tree is a right cylinder 1.5 m in radius and 10 m high. The volume of the timber which remains when the trunk is trimmed just enough to reduce it to a rectangular parallelopiped on a square base is

(a) 44 m3 (b) 45 m3 (c) 46 m3 (d) 47 m3

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13. The radius of a cylindrical cistern is 10 metres and its height is 15 metres. Initially the cistern is empty. We start filling the cistern with water through a pipe whose diameter is 50 cm. Water is coming out of the pipe with a velocity of 5 m/sec. How many minutes will it take in filling the cistern with water? (a) 20 (b) 40 (c) 60 (d) 80

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Section A Question Bank 27

1. The volume of a wall, 5 times as high as its breadth and 8 times as long as it is high is $18225 \ \ \mathrm{m}^3$. Find the breadth of the wall.

A. 32.5 m

B. 5 m

C. 4.5 m

D. 3.5 m

Answer: C

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2. The volume of a rectangular block of stone is 10368 dm3. Its dimensions are in the ratio of 3 : 2 : 1. If its entire surface is polished at 2 paise per dm2, then the total cost will be (a) Rs 31.50 (b) Rs 31.68 (c) Rs 63 (d) Rs 63.36

A. Rs. 31.50

B. Rs. 63.00

C. Rs. 63.36

D. Rs. 31.63

Answer: C

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3. One cubic metre of copper is melted and recast into a square cross - section bar 36 m long. An exact cube is cut off from this bar. If 1 cubic metre of copper costs Rs. 108, then the cost of this cube is

A. 50 paise

B. 75 paise

C. One rupees

D. 1.50 rupees

Answer: A

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4. A water tank is 30 m long, 20 m wide and 12 m deep. It is made of iron sheet which is 3 m wide. The tank is open at the top. If the cost of the iron sheet is Rs 10 per metre, then the

total costs of the iron sheet required to build the tank is (a) Rs 6000 (b) Rs 8000 (c) Rs 9000 (d) Rs 10000

A. Rs. 6000

B. Rs. 8000

C. Rs. 9000

D. Rs. 10000

Answer: A

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5. The sum of the length, breadth and depth of a cuboid is 19cm and its diagonal is $5\sqrt{5}\,cm$. Its surface area is: $361\,cm^2$ (b) $124\,cm^2$ $236\,cm^2$ (d) $486\,cm^2$

A. $361\ \text{cm}^2$

B. $125\ \text{cm}^2$

C. $236\ \text{cm}^2$

D. $256\ \text{cm}^2$

Answer: C

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6. A solid cube with an edge 10 cm is melted to form two equal cubes. The ratio of the edge of the smaller cube to the edge of the bigger cube is

A. $\left(\frac{1}{3}\right)^{\frac{1}{3}}$

B. $\frac{1}{2}$

C. $\left(\frac{1}{2}\right)^{\frac{1}{3}}$

D. $\left(\frac{1}{4}\right)^{\frac{1}{3}}$

Answer: C

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7. A rectangular tank 25 cm long and 20 cm wide contains 4.5 litres of water. When a metal cube is low ered in the tank, the water level rises to a height of 11 cm. Find the length of each edge of the cube ?

A. 15 cm

B. 5 cm

C. 11 cm

D. 10 cm

Answer: D

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8. An icecream company makes a popular brand of icecream in a rectangular shaped bar 6 cm long 5 cm wide and 2 cm thick. To cut costs, the company has decided to reduce the volume of the box by 20%. The thickness will remain the same but the length and width will

be decreased by the same percentage amount.

Which condition given below will the new length l satisfy ?

A. $5.5 < l < 6$

B. $5 < l < 5.5$

C. $4.5 < l < 5$

D. $4 < l < 4.5$

Answer: B

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9. Three cubes with sides in the ratio 3 : 4 : 5 are melted to form a single cube whose diagonal is $12\sqrt{3}cm$. The sides of the cubes are (a) 3 cm, 4 cm, 5 cm (b) 6 cm, 8 cm, 10 cm (c) 9 cm, 12 cm, 15 cm (d) None of these

A. 6 cm, 8 cm, 10 cm

B. 3 cm, 4 cm, 5 cm

C. 9 cm, 12 cm, 15 cm

D. 12 cm, 16 cm, 20 cm

Answer: A

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10. A, B, C denote the areas of three co-terminus faces of a cuboid. If P and S denote the product and sum of dimensions of the cuboid respectively, which one of the following is correct ?

A. $\mathrm{PS} = A^2 + B^2 + C^2$

B. $\mathrm{PS} = AB + BC + CA$

C. $P = S(A + B + C)$

D. $\mathrm{SP} = (A + B + C)^2$

Answer: B

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11. A cuboid has edges of x cm, 1 cm and 2 cm. The total surface area of the cuboid has a numerical value which is some integral multiple of the numerical value of its volume. What is the value of x for minimum possible positive integral multiple ?

A. 5 cm

B. 2 cm

C. 3 cm

D. 4 cm

Answer: B

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12. A metallic sheet is of the rectangular shape with dimensions $48cmx36cm$. From each one of its corners, a square of $8cm$ is cutoff. An

open box is made of the remaining sheet. Find the volume of the box.

A. 5120

B. 8960

C. 4830

D. 6400

Answer: A

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13. Except for one face of a given cube, identical cubes are glued through their faces to all the other faces of the given cube. If each side of the given cube measures 3 cm, then what is the total surface area of the solid body thus formed? (a) 225 cm2 (b) 234 cm2 (c) 270 cm2 (d) 279 cm2

A. $225 \ \ \mathrm{cm}^2$

B. $234 \ \ \mathrm{cm}^2$

C. $270 \ \ \mathrm{cm}^2$

D. $279 \quad \mathrm{cm}^2$

Answer: B

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14. A cube having each side of unit length is cut into two parts by plane through two diagonals of two opposite faces. What is the total surface area of each of these parts ?

A. $3 + \sqrt{2}$ sq. units

B. $2 + \sqrt{3}$ sq. units

C. $3\sqrt{2}$ sq. units

D. 3 sq. units

Answer: A

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15. A cuboid is formed of 3 edges measuring 3,4 and 5 cm. It is sliced into two identical solids by a plane through a diagonal of the

smallest of the faces. The surface area of the sliced section is

A. $12 \quad \mathrm{cm}^2$

B. $15 \quad \mathrm{cm}^2$

C. $20 \quad \mathrm{cm}^2$

D. $25 \quad \mathrm{cm}^2$

Answer: D

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16. A square hole of cross - sectional area $4\ \ \mathrm{cm}^2$ is drilled across a cube with its length parallel to a side of the cube. If an edge of the cube measures 5 cm, what is the total surface area of the body so formed ?

A. $140\ \ \mathrm{cm}^2$

B. $142\ \ \mathrm{cm}^2$

C. $162\ \ \mathrm{cm}^2$

D. $182\ \ \mathrm{cm}^2$

Answer: D

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17. The area of a side of a box is 120 sq. cm. The area of the other side of the box is 72 sq. cm. If the area of the upper surface of the box is 60 sq. cm. then find the volume of the box ?

A. $259200 \quad \mathrm{cm}^3$

B. $84000 \quad \mathrm{cm}^3$

C. $86400 \quad \mathrm{cm}^3$

D. $720 \quad \mathrm{cm}^3$

Answer: D

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18. A rectangular tank is 225 m by 162 m at the base. With what speed must the water flow into it through an aperture 60 cm by 45 cm that the level may be raised 20 cm in 5 hours.

A. 5000 m/hr

B. 5200 m/hr

C. 5400 m/hr

D. 5600 m/hr

Answer: C

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19. Water in a rectangular reservoir having base 80m by 60m is 6.5m deep. In what time can the water be emptied by a pipe of which the cross-section is a square of side 20cm, if the water runes through the pipe at the rate of 15 km/hr.

A. 26 hours

B. 42 hours

C. 52 hours

D. 65 hours

Answer: C

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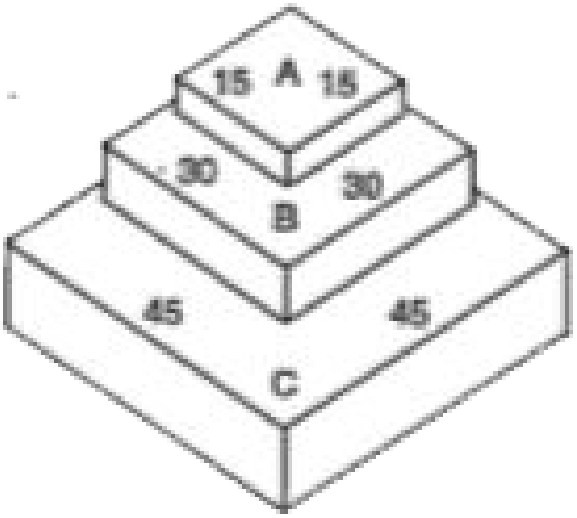
20. A cake as shown has three layers , each of which is a cuboid as shown. The bases of these cuboids are squares whose sides are of

lengths 15 cm, 30 cm and 45 cm cm. The height of each layer is 5 cm. Find the total area of the cake that must be frosted. Assume that there will be frosting between the layers, but not at the bottom of the cake.



A. $5000 \ \ \text{cm}^2$

B. $4000 \ \ \text{cm}^2$

C. $4950 \quad \mathrm{cm}^2$

D. $4500 \quad \mathrm{cm}^2$

Answer: C

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Section B Question Bank 27

1. The volume of a right cirular cylinder with its height equal to the redius is $25\frac{1}{7}cm^3$. Find the height of the cylinder.

A. π cm

B. 3 cm, 4 cm, 5 cm

C. 4 cm

D. 2 cm

Answer: D

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2. The volume of a right circular cylinder whose height is 40cm, and circumference of its base is 66 cm, is:

A. $55440 \quad \mathrm{cm}^3$

B. $34650 \quad \mathrm{cm}^3$

C. $7720 \quad \mathrm{cm}^3$

D. $13860 \quad \mathrm{cm}^3$

Answer: D

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3. If $\pi \quad \mathrm{cm}^3$ of metal is stretched to a wire of length 3600 m, then the diameter of the wire will be

A. $\frac{1}{600}$ cm

B. $\frac{1}{300}$ cm

C. $\frac{1}{200}$ cm

D. $\frac{1}{100}$ cm

Answer: B

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4. The number of iron rods, each of length 7 m and diameter 2 cm that can be made out of

0.88 cubic metres of iron is $\left(\pi = \frac{22}{7}\right)$

A. 300

B. 400

C. 500

D. 600

Answer: B

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5. the curved surface area of a cylindrical pillar is 264 m square and its volume is 924 m cube . Find ratio of the diameter and the height of the pillar.

A. $3:7$

B. $7:3$

C. $6:7$

D. $7:6$

Answer: B

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6. The volume of a right circular cylinder, 14 cm in height is equal to that of a cube whose edge is 11 cm. The radius of the base of the cylinder is (a) 5.2 cm (b) 5.5 cm (c) 11 cm (d) 22 cm

A. 5.2 cm

B. 5.5 cm

C. 11 cm

D. 22 cm

Answer: B

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7. The number of coins of radius 0.75 cm and thickness 0.2 cm to be melted to make a right circular cylinder of height 8 cm and base radius 3 cm is

A. 460

B. 500

C. 600

D. 640

Answer: D

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8. A hollow iron pipe of 21 cm long and its external diameter is 8 cm. If the thickness of the pipe is 1 cm and iron weights $8\,\mathrm{g/cm^3}$, then the weight of the pipe is

A. 3.6 kg

B. 3.696 kg

C. 36 kg

D. 36.9 kg

Answer: B

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9. A well 20 m in diameter is dug 14 m deep and the earth taken out is spread all round it to a width of 5 m to form an embankment. The height of the embankment is

A. 10 m

B. 11 m

C. 11.2 m

D. 11.5 m

Answer: C

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10. The height of a right circular cylinder is 6 m. If three times the sum of the areas of its two circular faces is twice the area of the

curved surface, then the radius of its base is

(a) 1 m (b) 2 m (c) 3 m (d) 4 m

A. 4 m

B. 3 m

C. 2 m

D. 1 m

Answer: A

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11. The ratio of the radii of two cylinders is $1:\sqrt{3}$ and their heights are in the ratio $2:3$. The ratio of their volumes is

A. $1:9$

B. $2:9$

C. $4:9$

D. $5:9$

Answer: B

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12. If the radius of a right circular cylinder is decreased by 50% and its height is increased by 60%, its volume will be decreased by

A. 10%

B. 60%

C. 40%

D. 20%

Answer: B

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13. The radii of the bases of two cylinders are in the ratio 3 : 5 and their heights are in the ratio 2 : 3. Find the ratio of their curved surface areas.

A. $2:5$

B. $2:3$

C. $3:5$

D. $5:3$

Answer: A

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14. The diameter of the base of a cylindrical drum is 35 dm and its height is 24 dm. It is full of kerosene How many tins each of size 25 cm $\times$ 22 cm $\times$ 35 cm can be filled with kerosene from the drum $\left(\pi = \frac{22}{7}\right)$

A. 1200

B. 1020

C. 600

D. 120

Answer: A

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15. If the diameter of a wire is decreased by 10% by how much per cent approximately will the length be increased to keep the volume constant ?

A. 5%

B. 17%

C. 20%

D. $23\ \%$

Answer: D

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16. The radius of a cylindrical cistern is 10 metres and its height is 15 metres. Initially the cistern is empty. We start filling the cistern with water through a pipe whose diameter is 50 cm. Water is coming out of the pipe with a velocity of 5 m/sec. How many minutes will it

take in filling the cistern with water? (a) 20 (b) 40 (c) 60 (d) 80

A. 20

B. 40

C. 60

D. 80

Answer: D

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17. The volume of a right circular cylinder can be obtained from its curved surface area by multiplying it by its

A. $\frac{\text{radius}}{2}$

B. $\frac{2}{\text{radius}}$

C. height

D. $2 \times$ height

Answer: A

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18. If the radius of a right circular cylinder open at both the ends is decreased by $25\,\%$ and the height of the cylinder is increased by $25\,\%$, then the surface area of the cylinder thus formed.

A. Remains unaltered

B. Increases by $25\,\%$

C. Decreases by $25\,\%$

D. Decreases by $6.25\,\%$

Answer: D

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19. It is required to fix a pipe such that water flowing through it at a speed of 7 metres per minute fills a tank of capacity 440 cubic metres in 10 minutes. The inner radius of the pipe should be $\sqrt{2}\,m$ (b) $2\,m$ (c) $\frac{1}{2}m$ (d) $\frac{1}{\sqrt{2}}m$

A. $\sqrt{2}$ m

B. 2 m

C. $\frac{1}{2}$ m

D. $\frac{1}{\sqrt{2}}$ m

Answer: A

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20. A rectangular piece of paper is 24 cm long and 22 cm wide. A cylinder is formed by rolling the paper along its length. The volume of the cylinder is

A. $924 \quad \mathrm{cm}^3$

B. $462 \quad \mathrm{cm}^3$

C. $264 \quad \mathrm{cm}^3$

D. $528 \quad \mathrm{cm}^3$

Answer: A

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21. A hollow right circular cylinder with height 8 cm and base radius 7 cm is opened out into

a rectangle What are the length and breadth of the rectangle respectively ?

A. 22 cm, 16 cm

B. 44 cm, 8 cm

C. 22 cm, 8 cm

D. 44 cm, 16 cm

Answer: B

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22. The magnitude of the volume of a closed right circular cylinder of unit height divided by the magnitude of the total surface area of the cylinder (r being the radius of the cylinder) is equal to

A. $\frac{1}{2}\left(1+\frac{1}{r}\right)$

B. $\frac{1}{2}\left(1+\frac{1}{r+1}\right)$

C. $\frac{1}{2}\left(1-\frac{1}{r}\right)$

D. $\frac{1}{2}\left(1-\frac{1}{r+1}\right)$

Answer: D

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23. A hollow cylindrical tube 20 cm long is made of iron and its external diameter is 8 cm. The volume of iron used in making the tube is $440 \ \ \mathrm{cm}^3$. What is the thickness of the tube ?

A. 1 cm

B. 0.5 cm

C. 2 cm

D. 1.5 cm

Answer: A

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24. What length of solid cylinder 2 cm in diameter must be taken to cast into a hollow cylinder of external diameter 12 cm, 0.25 cm thick and 15 cm long? (a) 42.3215 cm (b) 44.0123 cm (c) 44.0625 cm (d) 44.6023 cm

A. 44.0123 cm

B. 42.3215 cm

C. 44.0625 cm

D. 44.6023 cm

Answer: C

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25. The volume of two cylinders are as a : b and their heights are c : d Find the ratio of their diameters ?

A. $\frac{ab}{bc}$

B. $\frac{ad^2}{ac^2}$

C. $\sqrt{\frac{ad}{bc}}$

D. $\sqrt{\frac{a}{b}} \times \frac{c}{d}$

Answer: C

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26. The inner diameter of a circular building is 54 cm and the base of the circular building occupies a space of $2464\ \mathrm{cm}^2$. The thickness of the wall is

A. 1 cm

B. 2 cm

C. 4 cm

D. 5 cm

Answer: A

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27. The sum of the radius of the base and height of a solid cylinder is 37m. If the total

surface area of the solid cylinder is $1628cm^2$.

Find the volume of the cylinder.

A. $4620 \quad \mathrm{m}^3$

B. $4630 \quad \mathrm{m}^3$

C. $4520 \quad \mathrm{m}^3$

D. $4830 \quad \mathrm{m}^3$

Answer: A

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28. Water flows out through a circular pipe whose internal diameter is 2 cm, at the rate of 6 m/s into a cyl- indrical tank, the radius of whose base is 60 cm, By how much will the level of water rise in 30 min?

A. 2 m

B. 3 m

C. 4 m

D. 5 m

Answer: B

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Self Assessment Sheet 26

1. The four walls of a room can be fully covered by 70 square wall papers of 2 m $\times$ 2 m size. The length os the room is 18 m and its breadth is twice that of its height. If the cost of carpeting is Rs. 20 per square metre, what will be the total expenditure in carpeting the room ?

A. Rs. 1800

B. Rs. 5040

C. Rs. 3600

D. Rs. 1400

Answer: C

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2. The weight of a cubic metre of a certain metal is 480 kg. It is melted and then rolled

into a square bar 4 m long. Now an exact cube is cut from it. Find the weight of the cube.

A. 240 kg

B. 80 kg

C. 120 kg

D. 60 kg

Answer: D

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3. The length, breadth and height of a cuboid are in the ratio $1:2:3$. The length, breadth and height of the cuboid are increased by $100\,\%$, $200\,\%$ and $200\,\%$ respectively. Then, the increase in the volume of the cuboid is

A. 5 times

B. 6 times

C. 12 times

D. 17 times

Answer: D

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4. The sum of length breadth and depth of a cuboid is 19 cm and the length of its diagonal is 11 cm. Find the total surface area of the cuboid.

A. $361 \quad \mathrm{cm}^2$

B. $240 \quad \mathrm{cm}^2$

C. $209 \quad \mathrm{cm}^2$

D. $121 \quad \mathrm{cm}^2$

Answer: B

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5. The external length, breadth and height of a closed rectangular wooden box are 18cm, 10cm and 6cm respectively and thickness of wood is $\frac{1}{2}cm$. When the box is empty, it weight 15kg and when filled with sand it weighs 100kg. Find the weight of one cubic cm of weed and cubic cm of sand.

A. $\frac{1}{7}\text{kg}, \frac{1}{9}\text{kg}$

B. $\frac{1}{21}\text{kg}, \frac{1}{9}\text{kg}$

C. $\frac{1}{21}\text{kg}, \frac{1}{7}\text{kg}$

D. $\frac{1}{9}\text{kg}, \frac{1}{7}\text{kg}$

Answer: B

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6. The radius of the base and height of a right circular cylinder are each increased by 20%.

The volume of the cylinder will be increased by

:

A. $40\ \%$

B. $60\ \%$

C. $72.8\ \%$

D. $96\ \%$

Answer: C

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7. The curved surface of a cylinder is $1000 \quad \mathrm{cm}^2$. A wire of diameter 5 mm is wound around it, so as to cover it completely. What is the length of the wire used ?

A. 22 m

B. 20 m

C. 18 m

D. None of these

Answer: B

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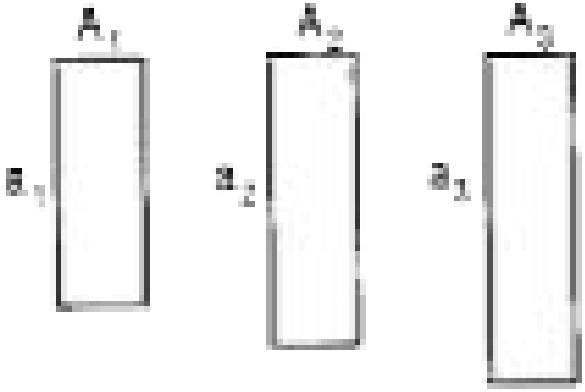
8. Three rectangles A_1, A_2 and A_3 have the same area Their lengths a_1, a_2 and a_3 respectively are such that $a_1 < a_2 < a_3$. Cylinders C_1, C_2 and C_3 are formed from A_1, A_2 and A_3 respectively by joining the parallel sides along the breadth. Then,



A. C_1 will enclose maximum volume

B. C_2 will enclose maximum volume

C. C_3 will enclose maximum volume

D. Each of C_1, C_2 and C_3 will enclose equal volume.

Answer: C

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9. The difference between the outside and inside surfaces of a cylindrical metal pipe 14 cm long is $44\ \text{cm}^2$. It the pipe is made of $99\ \text{cm}^3$ of metal, find the sum of the inner and outer radii of the pipe ?

A. 4.5 cm

B. 3.5 cm

C. 2 cm

D. 5.5 cm

Answer: A

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10. Water is flowing at the rate of 3km/hr through a circular pipe of 20cm internal diameter into a circular cistern of diameter 10m and depth 2m. In how much time will the cistern be filled?

A. 2 hours

B. 1 hour 50 min

C. 1 hour 15 min

D. 2 hours 30 min

Answer: B

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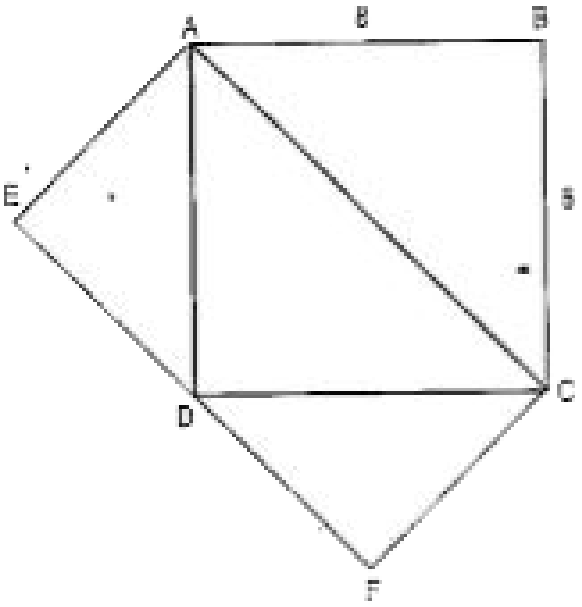
Unit Test 5

1. ABCD is a rectangle of dimensions 8 units and 6 units AEFC is a rectangle drawn in such a way that diagonal AC of the first rectangle is one side and side opposite to it is touching

the first rectangle at D as shown in the figure. What is the ratio of the area of rectangle ABCD to that of AEFC ?



A. 2

B. $3/2$

C. 1

D. $8/9$

Answer: C

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2. The difference between the area of a square and that of an equilateral triangle on the same base is 1/4 cm^2. What is the length of side of triangle ?

A. $\left(4-\sqrt{3}\right)^{1/2}$ cm

B. $\left(4+\sqrt{3}\right)^{1/2}$ cm

C. $\left(4-\sqrt{3}\right)^{-1/2}$ cm

D. $\left(4+\sqrt{3}\right)^{-1/2}$ cm

Answer: C

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3. If x and y are respectively the areas of a square and a rhombus of sides of same length. Then what is $x:y$?

A. $1:1$

B. $2:\sqrt{3}$

C. $4:\sqrt{3}$

D. $3:2$

Answer: A

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4. If the area of a circle inscribed in an equilateral triangle is $4\pi \ \mathrm{cm}^2$ then what is the area of the triangle ?

A. $12\sqrt{3}\ \text{cm}^2$

B. $9\sqrt{3}\ \text{cm}^2$

C. $8\sqrt{3}\ \text{cm}^2$

D. $18\ \text{cm}^2$

Answer: A

View Text Solution

5. The length of rectangle is twice the diameter of circle. The circumfernec of the circle is equal to the area of a square of side

22 cm. What is the breasth of the rectangle if its perimeter is 668 cm.

A. 24 cm

B. 26 cm

C. 52 cm

D. cannot be determined

Answer: B

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6. The two diagonals of a rhombus are of lengths 55 cm and 48 cm. If p is the perpendicular height of the rhombus, then which one of the following is correct ?

A. $36\text{ cm} < p < 37\text{ cm}$

B. $35\text{ cm} < p < 36\text{ cm}$

C. $34\text{ cm} < p < 35\text{ cm}$

D. $33\text{ cm} < p < 34\text{ cm}$

Answer: A

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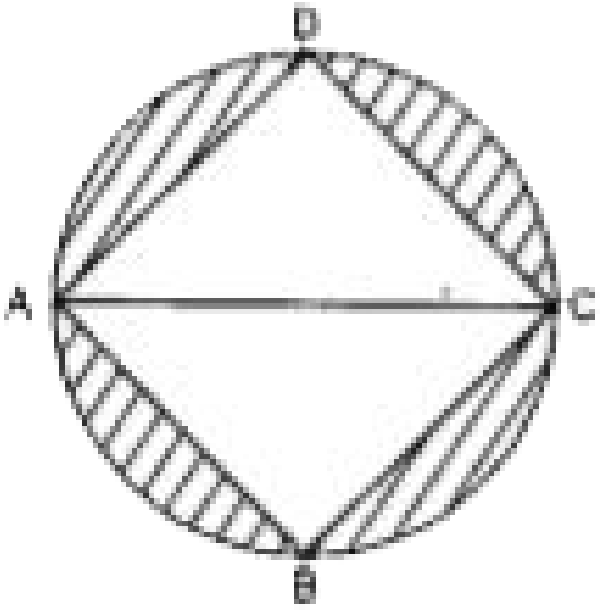
7. In the given figure, AC is a diameter of a circle with radius 5 cm. if $AB = BC$ and $CD = 8$ cm, the area of the shaded region to the nearest whole number is



A. $28 \quad \mathrm{cm}^2$

B. $29 \quad \mathrm{cm}^2$

C. $30 \quad \mathrm{cm}^2$

D. $45 \quad \mathrm{cm}^2$

Answer: C

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8. The radius of a circle is 20 cm. Three more concentric circles are drawn inside it in such a

manner that it is divided into 4 equal parts. Find the radius of the smallest circle ?

A. 5 cm

B. 4 cm

C. 10 cm

D. 8 cm

Answer: C

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9. ABCD is a trapezium in which $AB \mid\mid CD$ and $AB = 2CD$. It its diagonals intersect each other at O then ratio of the area of triangle AOB and COD is

A. $1:2$

B. $2:1$

C. $1:4$

D. $4:1$

Answer: D

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10. If the perimeter of an isosceles right triangle is $\left(6+3\sqrt{2}\right)m$, then the area of the triangle is $4.5\,m^2$ (b) $5.4\,m^2$ (c) $9\,m^2$ (d) $81\,m^2$

A. $4.5\ \mathrm{m}^2$

B. $5.4\ \mathrm{m}^2$

C. $9\ \mathrm{m}^2$

D. $81\ \mathrm{m}^2$

Answer: A

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11. Sixteen cylindrical cans each with a radius of 1 unit are placed inside a cardboard box four in a row. If the cans touch the adjacent cans and or the walls of the box, then which of the following could be the interior area of the bottom of the box in square units ?

A. 16

B. 32

C. 64

D. 128

Answer: C

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12. 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. 430

B. 44

C. 460

D. 450

Answer: D

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13. A solid metallic cube of edge 4 cm is melted and recast into solid cubes of edge 1 cm. If x is the surface area of the melted cube and y is

the total surface area of the cubes recast, then what is $x : y$?

A. $2 : 1$

B. $1 : 2$

C. $1 : 4$

D. $4 : 1$

Answer: C

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14. A cylindrical vessel of base radius 14 cm is filled with water to some height. If a rectangular solid of dimensions 22 cm $\times$ 7 cm $\times$ 5 cm is immersed in it what is the rise in the water level ?

A. 0.5 cm

B. 1.25 cm

C. 1 cm

D. 1.5 cm

Answer: B

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15. Increasing the radius of a cylinder by 6 units increases the volume by y cubic units. Increasing the altitude of the cylinders by 6 units also increases the volume by y cubic units. If the original altitude is 2, then the original radius is ?

A. 8 units

B. 4 units

C. 6 units

D. 5 units

Answer: C

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16. A metallic cube of edge 2.5 cm is melted and recasted into the form of a cuboid of base 1.25 cm $\times 0.25$ cm. Find the increase in the surface area.

A. $123.325 \ \text{cm}^2$

B. $150.625 \quad \mathrm{cm}^2$

C. $113.125 \quad \mathrm{cm}^2$

D. $37.5 \quad \mathrm{cm}^2$

Answer: C

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17. The volume of metallic cylindrical pipe is $748\, cm^3$. Its length is 14cm and its external radius is 9cm. Find its thickness.

A. 1.5 cm

B. 0.5 cm

C. 2 cm

D. 1 cm

Answer: D

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18. A rectangular paper 11 cm by 8 cm can be exactly wrapped to cover the curved surface of

a cylinder of height 8 cm. the volume of the cylinder is

A. $66 \quad \mathrm{cm}^3$

B. $77 \quad \mathrm{cm}^3$

C. $88 \quad \mathrm{cm}^3$

D. $121 \quad \mathrm{cm}^3$

Answer: B

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19. A solid cylinder has total surface area of 462 square cm. Its curved surface area is one-third of its total surface area. Find the volume of the cylinder. (Take $\pi = 22/7$)

A. $792 \ \text{cm}^3$

B. $539 \ \text{cm}^3$

C. $495 \ \text{cm}^3$

D. $676 \ \text{cm}^3$

Answer: B

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20. 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 ?

A. 60000

B. 66000

C. 48000

D. 50000

Answer: C

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