CDS 1 2025

LIVE

MATHS

MENSURATION 3D

CLASS 4

NAVJYOTI SIR

Crack
EXAMS

18 Nov 2024 Live Classes Schedule

8:00AM	18 NOVEMBER 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	18 NOVEMBER 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

NDA 1 2025 LIVE CLASSES

11:30AM	GK - ECONOMICS - CLASS 1	RUBY MA'AM
1:00PM	GS - CHEMISTRY MCQ - CLASS 9	SHIVANGI MA'AM
5:30PM	MATHS - SEQUENCE & SERIES - CLASS 4	NAVJYOTI SIR

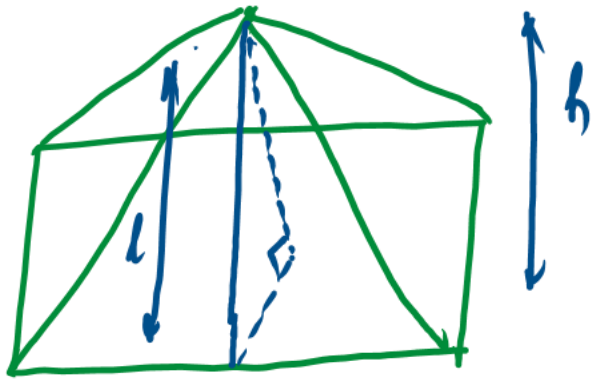
CDS 1 2025 LIVE CLASSES

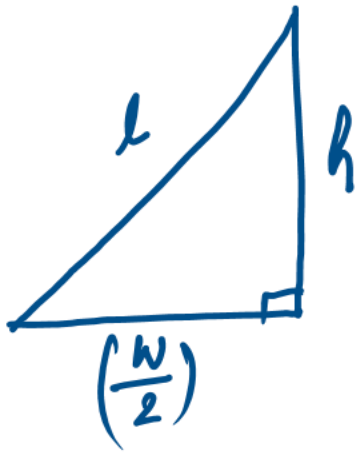
11:30AM	GK - ECONOMICS - CLASS 1	RUBY MA'AM
1:00PM	GS - CHEMISTRY MCQ - CLASS 9	SHIVANGI MA'AM
7:00PM	MATHS - MENSURATION 3D - CLASS 4	NAVJYOTI SIR

SSBCrack EXAMS

QUESTION

A rectangular base pyramid has base length 15 cm and width 8 cm. The height of the pyramid is 20 cm. Find volume. LSA and TSA.





$LSA = \frac{1}{2} \times 2(l+b) \times \text{slant ht.}$

$l^2 = h^2 + \left(\frac{w}{2}\right)^2 = (20)^2 + \left(\frac{8}{2}\right)^2 = 400 + 16$

$l = \sqrt{416} = 4\sqrt{26}$

$LSA = (15+8)\sqrt{416} = 23 \times 4\sqrt{26}\ cm^2$

$TSA = 92\sqrt{26} + 15 \times 8\ cm^2$

4 x 104
4 x 13 x 8
$4\sqrt{26}$

Q) A pipe with square cross–section is supplying water to a cistern which was initially empty. The area of cross–section is 4 cm^2 and the nozzle velocity of water is 40 m/s. The dimensions of the cistern are 10 m × 8 m × 6 m. Then the cistern will be full in

(a) 9.5 hours
(b) 9 hours
(c) 8 hours 20 minutes
(d) 8 hours

Volume of cistern filled by pipe per second = Area × velocity

= 4 cm^2 × 40 × 100 cm/s

= 16,000 cm^3/s

Volume of cistern = $10 \times 8 \times 6$ m^3

$= 480$ m^3

$$\text{Time to fill} = \frac{\text{Volume of cistern}}{\text{Volume filled per second}} = \frac{480 \times 10^6 \text{ cm}^3}{16 \times 10^3 \text{ cm}^3/\text{s}} = 30 \times 10^3$$

$= 30,000$

$= \frac{30000}{60 \times 60}$ h $= \frac{50}{6} = 8\frac{2}{6}$ h

$= 8\frac{1}{3}$ h $=$ 8 hr 20 mins

Volume = Area of cross section x velocity x Time

Volume per second = Area of cross section x velocity

Q) A pipe with square cross–section is supplying water to a cistern which was initially empty. The area of cross–section is 4 cm^2 and the nozzle velocity of water is 40 m/s. The dimensions of the cistern are 10 m × 8 m × 6 m. Then the cistern will be full in

(a) 9.5 hours
(b) 9 hours
(c) 8 hours 20 minutes
(d) 8 hours

Ans: (c)

Q) A cubic metre of copper weighing 9000 kg is rolled into a square bar 9 m long. An exact cube is cut off from the bar; How much does the cube weigh ?

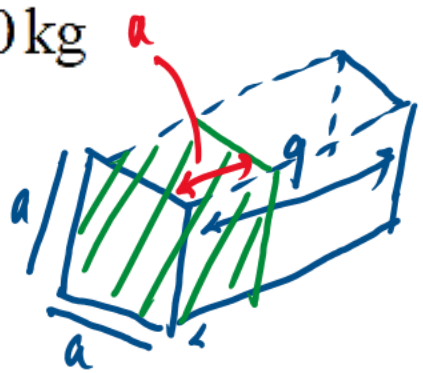
(a) 1000 kg

(b) $\frac{1000}{3}$ kg

(c) 300 kg

(d) $\frac{500}{3}$ kg

$1\ m^3$ — 9000 kg



$l = b = a$

Volume of square bar = $1\ m^3$

$a^2 \times 9 = 1$

$a^2 = \frac{1}{9} \Rightarrow a = \frac{1}{3}$ m

Volume of cube - cut off

$a^3 = \left(\frac{1}{3}\right)^3 = \frac{1}{27}\ m^3$

1 — 9000

$\frac{1}{27} \rightarrow \frac{9000}{27} = \frac{1000}{3}$ kg

Q) A cubic metre of copper weighing 9000 kg is rolled into a square bar 9 m long. An exact cube is cut off from the bar; How much does the cube weigh ?

(a) 1000 kg

(b) $\frac{1000}{3}$ kg

(c) 300 kg

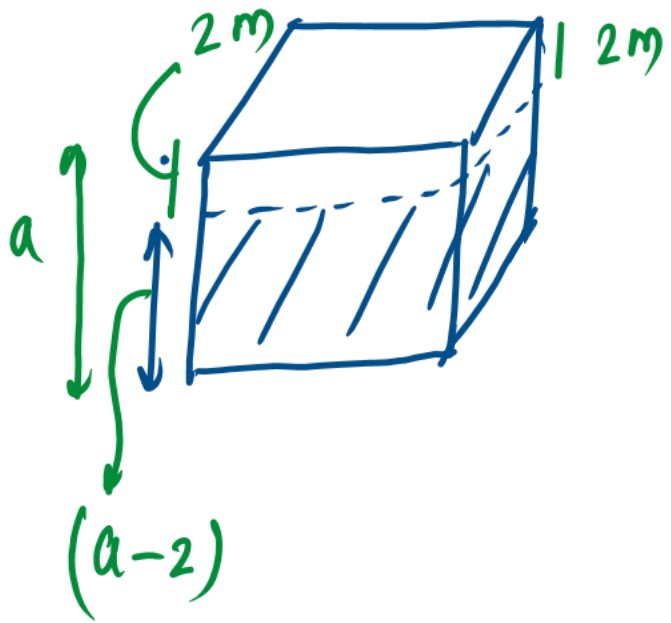
(d) $\frac{500}{3}$ kg

Ans: (b)

Q) A large water tank has the shape of a cube. If 128 m^3 of water is pumped out, the water level goes down by 2 m. Then the maximum capacity of the tank is

(a) 512 m^3 (b) 480 m^3

(c) 324 m^3 (d) 256 m^3



$a^3 - 128 = a^2 \times (a-2)$

$a^3 - 128 = a^3 - 2a^2$

$2a^2 = 128$

$a^2 = 64 \Rightarrow a = 8$ m

max. capacity $= 8^3 =$ 512 m^3

Q) A large water tank has the shape of a cube. If 128 m^3 of water is pumped out, the water level goes down by 2 m. Then the maximum capacity of the tank is

(a) 512 m^3 (b) 480 m^3

(c) 324 m^3 (d) 256 m^3

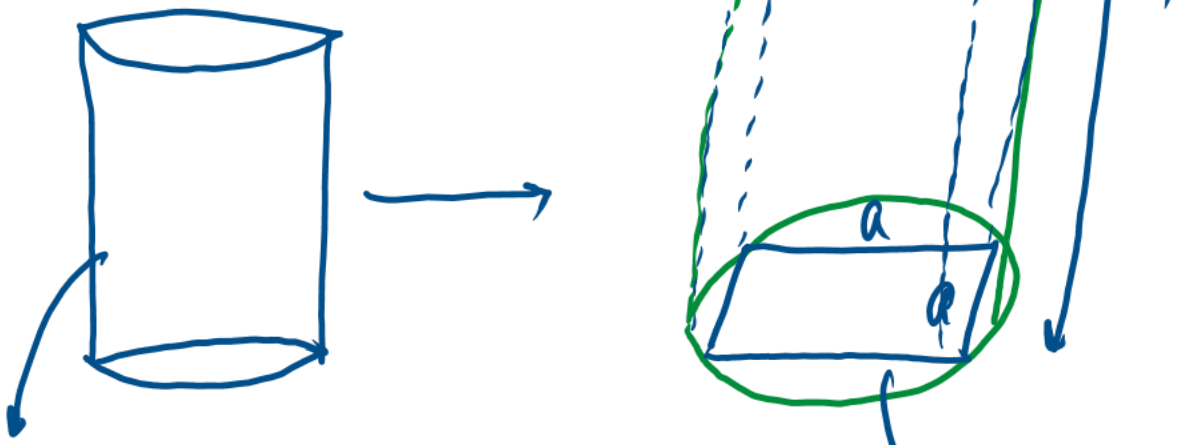
Ans: (a)

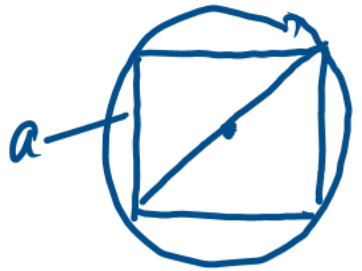
3/2

Q) 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) $44\,m^3$ ✓ (b) $46\,m^3$

(c) $45\,m^3$ (d) $47\,m^3$





$2r = \sqrt{2}a$

$a = \sqrt{2}r$

Volume $= 3.14 \times \frac{3}{2} \times \frac{3}{2} \times 10 =$

Vol. $= a^2 \times h$

$(\sqrt{2} \times \frac{3}{2})^2 \times 10$

volume of cylinder − vol. of parallelopiped

$$3.142 \times 10 \times \left(\frac{3}{2}\right)^2 - \left(\frac{3}{2} \times \sqrt{2}\right)^2 \times 10$$

$$10 \times \left(\frac{3}{2}\right)^2 \left[3.142 - 2\right]$$

$$\frac{45}{2}\left[1.142\right] = 45 \times 0. < \underline{45\ m}$$

Q) 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) $44\,m^3$ (b) $46\,m^3$

(c) $45\,m^3$ (d) $47\,m^3$

Ans: (a)

Q) In a swimming pool measuring 90 m by 40 m, 150 men take a dip. If the average displacement of water by a man is 8 cubic metres, what will be the rise in water level?

(a) 33.33 cm (b) 30 cm

(c) 20 cm (d) 25 cm

$90 \times 40 \times \text{rise in ht.} = 150 \times 8$

$$h = \frac{150 \times 8}{90 \times 40} = \frac{1}{3} \times 100 = 33.33 \text{ cm}$$

$$= \frac{1}{3} \text{ m}$$

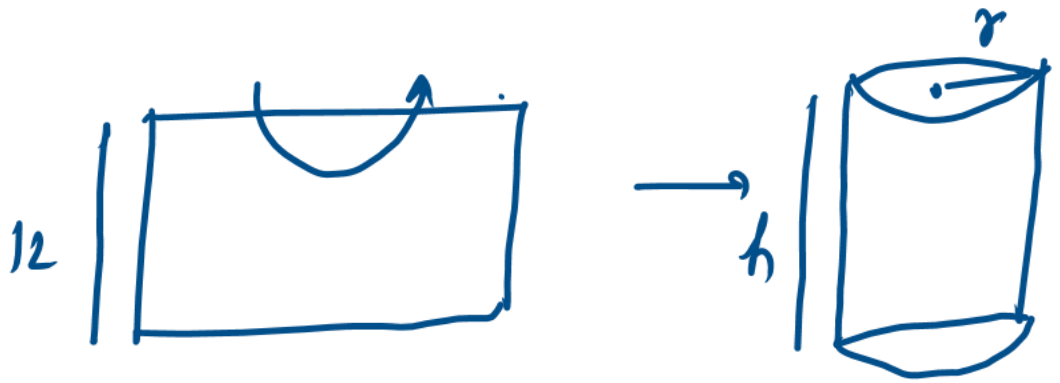
Q) In a swimming pool measuring 90 m by 40 m, 150 men take a dip. If the average displacement of water by a man is 8 cubic metres, what will be the rise in water level?

(a) 33.33 cm
(b) 30 cm
(c) 20 cm
(d) 25 cm

Ans: (a)

Q) A rectangular piece of paper of dimensions 22 cm by 12 cm is rolled along its length to form a cylinder. The volume (in cm^3) of the cylinder so formed is (use $\pi = \frac{22}{7}$)

(a) 562 (b) 412
(c) 462 (d) 362



$2\pi r = 22$

$2 \times \frac{22}{7} \times r = 22$

$r = \frac{7}{2}$ cm

$h = 12$ cm

Vol. $= \pi r^2 h$

$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 12$ $= 66 \times 7$

$= 462$ cm^3

Q) A rectangular piece of paper of dimensions 22 cm by 12 cm is rolled along its length to form a cylinder. The volume (in cm^3) of the cylinder so formed is $\left(\text{use } \pi = \frac{22}{7}\right)$

(a) 562
(b) 412
(c) 462
(d) 362

Ans: (c)

Q) How many spherical bullets each of 4 cm in diameter can be made out of a cube of lead whose edge is 44 cm ?

(a) 2541 (b) 2551

(c) 2561 (d) 2571

$$(44)^3 = \frac{4}{3} \times \pi (2)^3 \times n$$

$$n = \frac{44 \times 44 \times 44}{\frac{4}{3} \times \frac{22}{7} \times 2 \times 2 \times 2} = 121 \times 21$$

$$= 11 \times 11 \times 21$$

$$= 11 \times 231 = 2541$$

Q) How many spherical bullets each of 4 cm in diameter can be made out of a cube of lead whose edge is 44 cm ?

(a) 2541 (b) 2551

(c) 2561 (d) 2571

Ans: (a)

Q) A river 2.5 m deep and 45 m wide is flowing at the speed of 3.6 km/hour. The amount of water that runs into the sea per minute is

(a) $6650\,m^3$ (b) $6750\,m^3$

(c) $6850\,m^3$ (d) $6950\,m^3$

Volume per unit time = Area x velocity

(length per unit time)

breadth x height

(width) (depth)

Q) A river 2.5 m deep and 45 m wide is flowing at the speed of 3.6 km/hour. The amount of water that runs into the sea per minute is

(a) $6650\,m^3$ (b) $6750\,m^3$

(c) $6850\,m^3$ (d) $6950\,m^3$

Ans: (b)

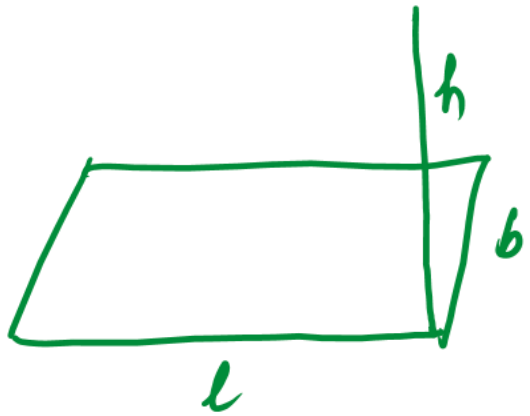
Q) The area of four walls of a room is $120 m^2$. The length of the room is twice its breadth. If the height of the room is 4 m, what is area of the floor ?

(a) $40 m^2$ (b) $50 m^2$
(c) $60 m^2$ (d) $80 m^2$

LSA

$2(l+b)h = 120$

$l = 2b$; $h = 4m$



$l \times b =$

Q) The area of four walls of a room is $120 m^2$. The length of the room is twice its breadth. If the height of the room is 4 m, what is area of the floor ?

(a) $40\,m^2$ (b) $50\,m^2$

(c) $60\,m^2$ (d) $80\,m^2$

Ans: (b)

Q) The ratio of the curved surface area to the total surface area of a right circular cylinder is 1 : 2. If the total surface area is 616 cm^2, what is the volume of the cylinder ?

(a) 539 cm^3 (b) 616 cm^3

(c) 1078 cm^3 (d) 1232 cm^3

$$2\pi rh = \frac{616}{2}$$

$$\frac{1}{2} = \frac{2\pi rh}{2\pi r(r+h)}$$

$$2\pi r(r+h) = 616$$

$$r(r+h) = \frac{\cancel{308} \; 616 \times 7}{\cancel{2} \times \cancel{22}_{11}}$$

$$\frac{1}{2} = \frac{rh}{r(r+h)}$$

Q) The ratio of the curved surface area to the total surface area of a right circular cylinder is 1 : 2. If the total surface area is 616 cm^2, what is the volume of the cylinder ?

(a) 539 cm^3 (b) 616 cm^3

(c) 1078 cm^3 (d) 1232 cm^3

Ans: (c)

Q) Into a conical tent of radius 8.4m and vertical height 3.5 m, how many full bags of wheat can be emptied, if space required for the wheat in each bag is $1.96\ m^3$? .

(a) 264
(b) 201
(c) 132
(d) 105

$$\frac{\frac{1}{3}\pi r^2 h}{1.96}$$

Q) Into a conical tent of radius 8.4m and vertical height 3.5 m, how many full bags of wheat can be emptied, if space required for the wheat in each bag is 1.96 m^3 ? .

(a) 264
(b) 201
(c) 132
(d) 105

Ans: (c)

Q) The radii of two solid iron spheres are 1 cm and 6 cm respectively. A hollow sphere is made by melting the two spheres. If the external radius of the hollow sphere is 9 cm, then its thickness (in cm) is

(a) 0.5 (b) 2 (c) 1.5 (d) 1

t = external radius − internal radius

$= R - r$

$t = 9 - r$

$= 9 - 1$

$= 8$

$\frac{4}{3}\pi(1)^3 + \frac{4}{3}\pi(6)^3 = \frac{4}{3}\pi(9^3 - r^3)$

$217 = 729 - r^3$

$r^3 = 729 - 217$

$512 = 8^3$

$r = 8$

Q) The radii of two solid iron spheres are 1 cm and 6 cm respectively. A hollow sphere is made by melting the two spheres. If the external radius of the hollow sphere is 9 cm, then its thickness (in cm) is

(a) 0.5 (b) 2 (c) 1.5 (d) 1

Ans: (d)

Q) From a solid wooden right circular cylinder, a right circular cone whose radius and height are same as the radius and height of the cylinder, respectively is carved out. What is the ratio of the volume of the utilised wood to that of the wasted wood?

(a) 1 : 2
(b) 2 : 1
(c) 2 : 3
(d) 1 : 3

$$\frac{\pi r^2 h}{\pi r^2 h - \frac{1}{3}\pi r^2 h}$$

Q) From a solid wooden right circular cylinder, a right circular cone whose radius and height are same as the radius and height of the cylinder, respectively is carved out. What is the ratio of the volume of the utilised wood to that of the wasted wood?

(a) 1 : 2
(b) 2 : 1
(c) 2 : 3
(d) 1 : 3

Ans: (a)

Q) If the heights and the areas of the base of a right circular cone and a pyramid with square base are the same, then they have

(a) same volume and same surface area
(b) same surface area but different volumes
(c) same volume but different surface areas ✓
(d) different volumes and different surface areas

$a^2 = \pi r^2 \Rightarrow a = \sqrt{\pi} r$

Vol. = $\frac{1}{3} \times \pi r^2 h$ — cone

pyramid — $\frac{1}{3} \times a^2 \times h$

Volume is same

Surface area

cone — $\pi r l + \pi r^2$ = $2\sqrt{\pi} r l$

pyramid — $\frac{1}{2}(4a) \times l + a^2$ = $2al$

not equal

Q) If the heights and the areas of the base of a right circular cone and a pyramid with square base are the same, then they have

(a) same volume and same surface area
(b) same surface area but different volumes
(c) same volume but different surface areas
(d) different volumes and different surface areas

Ans: (c)

Q) The length, breadth and height of a box are respectively 14 m, 12 m and 13 m. The length of the greatest rod that can be put in it is

(a) 22.31 m
(b) 22.56 m
(c) 20 m
(d) 19.5 m

Q) The length, breadth and height of a box are respectively 14 m, 12 m and 13 m. The length of the greatest rod that can be put in it is

(a) 22.31 m
(b) 22.56 m
(c) 20 m
(d) 19.5 m

Ans: (b)

Q) What is the quantity of cloth required to roll up to form a right circular tent whose base is of radius 12 m and height 5 m?

(a) 40π sq m
(b) 60π sq m
(c) 78π sq m
(d) 156π sq m

Q) What is the quantity of cloth required to roll up to form a right circular tent whose base is of radius 12 m and height 5 m?

(a) 40π sq m
(b) 60π sq m
(c) 78π sq m
(d) 156π sq m

Ans: (d)

Q) A cylinder is surmounted by a cone at one end, a hemisphere at the other end. The common radius is 3.5 cm, the height of the cylinder is 6.5 cm and the total height of the structure is 12.8 cm. The volume V of the structure lies between

(a) 370 cm^3 and 380 cm^3
(b) 380 cm^3 and 390 cm^3
(c) 390 cm^3 and 400 cm^3
(d) None of these

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(a) 370 cm^3 and 380 cm^3 (b) 380 cm^3 and 390 cm^3
(c) 390 cm^3 and 400 cm^3 (d) None of these

Ans: (a)

Q) A cone, a hemisphere and a cylinder stand on equal bases and have the same height, the height being equal to the radius of the circular base. Their total surface areas are in the ratio:

(a) $(\sqrt{2}+1):3:4$

(b) $(\sqrt{3}+1):3:4$

(c) $\sqrt{2}:3:4$

(d) $\sqrt{3}:7:8$

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(a) $(\sqrt{2}+1):3:4$

(b) $(\sqrt{3}+1):3:4$

(c) $\sqrt{2}:3:4$

(d) $\sqrt{3}:7:8$

Ans: (a)

Q) 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 :

(a) $\sqrt{2}$ m

(b) 2m

(c) $\frac{1}{2}$ m

(d) $\frac{1}{\sqrt{2}}$ m

Q) 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 :

(a) $\sqrt{2}$ m

(b) 2m

(c) $\frac{1}{2}$ m

(d) $\frac{1}{\sqrt{2}}$ m

Ans: (a)

Q) A right prism has a square base with side of base 4 cm and the height of prism is 9 cm. The prism is cut in three parts of equal heights by two planes parallel to its base. What is the ratio of the volume of the top, middle and the bottom part respectively?

(a) 1 : 8 : 27
(b) 1 : 7 : 19
(c) 1 : 8 : 20
(d) 1 : 1 : 1

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(a) 1 : 8 : 27
(b) 1 : 7 : 19
(c) 1 : 8 : 20
(d) 1 : 1 : 1

Ans: (d)

Q) The height and the total surface area of a right circular cylinder are 4 cm and 8π sq.cm. respectively. The radius of the base of cylinder is

(a) $\left(2\sqrt{2}-2\right)$ cm

(b) $\left(2-\sqrt{2}\right)$ cm

(c) 2 cm

(d) $\sqrt{2}$ cm

Q) The height and the total surface area of a right circular cylinder are 4 cm and 8π sq.cm. respectively. The radius of the base of cylinder is

(a) $\left(2\sqrt{2}-2\right)$ cm

(b) $\left(2-\sqrt{2}\right)$ cm

(c) 2 cm

(d) $\sqrt{2}$ cm

Ans: (a)

Q) A semicircular sheet of paper of diameter 28 cm is bent to cover the exterior surface of an open conical ice-cream cup. The depth of the ice-cream cup is

(a) 10.12 cm
(b) 8.12 cm
(c) 12.12 cm
(d) 14.12 cm

Q) A semicircular sheet of paper of diameter 28 cm is bent to cover the exterior surface of an open conical ice-cream cup. The depth of the ice-cream cup is

(a) 10.12 cm
(b) 8.12 cm
(c) 12.12 cm
(d) 14.12 cm

Ans: (d)

Q) A cylinder is filled to 4/5th its volume. It is then filled so that the level of water coincides with one edge of its bottom and top edge of the opposite side, In the process, 30 cc of the water is spilled. What is the volume of the cylinder?

(a) 75 cc
(b) 96 cc
(c) Data insufficient
(d) 100 cc

Q) A cylinder is filled to 4/5th its volume. It is then filled so that the level of water coincides with one edge of its bottom and top edge of the opposite side, In the process, 30 cc of the water is spilled. What is the volume of the cylinder?

(a) 75 cc
(b) 96 cc
(c) Data insufficient
(d) 100 cc

Ans: (d)

Q) 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 will be :

(a) 5 times
(b) 6 times
(c) 12 times
(d) 17 times

Q) 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 will be :

(a) 5 times
(b) 6 times
(c) 12 times
(d) 17 times

Ans: (d)

Q) If x is the curved surface area and y is the volume of a right circular cylinder, then which one of the following is correct?

(a) Only the ratio of the height to radius of the cylinder is independent of x

(b) Only the ratio of height to radius of the cylinder is independent of y

(c) Either (a) or (b)

(d) Neither (a) nor (b)

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(a) Only the ratio of the height to radius of the cylinder is independent of x

(b) Only the ratio of height to radius of the cylinder is independent of y

(c) Either (a) or (b)

(d) Neither (a) nor (b)

Ans: (d)

Q) A drainage tile is a cylindrical shell 21 cm long. The inside and outside diameters are 4.5 cm and 5.1 cm, respectively. What is the volume of the clay required for the tile?

(a) $6.96\pi\,cm^3$
(b) $6.76\pi\,cm^3$
(c) $5.76\pi\,cm^3$
(d) None of these

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(a) $6.96\pi\,cm^3$
(b) $6.76\pi\,cm^3$
(c) $5.76\pi\,cm^3$
(d) None of these

Ans: (d)

Q) The volume of spheres are proportional to the cubes of their radii. Two spheres of the same material weigh 3.6 kg and 2.7 kg and the radius of the smaller one is 2 cm. If the two were melted down and formed into a single sphere, what would be its radius?

(a) 4 cm
(b) 4.3 cm
(c) 3 cm
(d) 2.6 cm

Q) The volume of spheres are proportional to the cubes of their radii. Two spheres of the same material weigh 3.6 kg and 2.7 kg and the radius of the smaller one is 2 cm. If the two were melted down and formed into a single sphere, what would be its radius?

(a) 4 cm
(b) 4.3 cm
(c) 3 cm
(d) 2.6 cm

Ans: (d)

Q) Let A be a pyramid on a square base and B be a cube. If a, b and c denote the number of edges, number of faces and number of corners, respectively. Then, the result $a = b + c$ is true for

(a) Only A
(b) Only B
(c) Both A and B
(d) Neither A nor B

Q) Let A be a pyramid on a square base and B be a cube. If a, b and c denote the number of edges, number of faces and number of corners, respectively. Then, the result $a = b + c$ is true for

(a) Only A
(b) Only B
(c) Both A and B
(d) Neither A nor B

Ans: (d)

Q) Consider the following statements in respect of four spheres A, B, C and D having respective radii 6, 8, 10 and 12 cm.

1. The surface area of sphere C is equal to the sum of surface areas of sphere A and B .
2. The volume of sphere D is equal to the sum of volumes of sphere A, B and C.

Which of the above statements is / are correct ?

(a) Only 1
(b) Only 2
(c) Both 1 and 2
(d) Neither 1 nor 2

Q) Consider the following statements in respect of four spheres A, B, C and D having respective radii 6, 8, 10 and 12 cm.

1. The surface area of sphere C is equal to the sum of surface areas of sphere A and B .
2. The volume of sphere D is equal to the sum of volumes of sphere A, B and C.

Which of the above statements is / are correct ?

(a) Only 1 (b) Only 2

(c) Both 1 and 2 (d) Neither 1 nor 2

Ans: (c)

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CLASS 1

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