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Volume and Surface Area Questions for IBPS RRB SCALE- I Pre & RRB Office Asst. Pre Exams – Volume and Surface Area Quiz at Smartkeeda.

V n S Area Quiz 9

Directions: Kindly study the following Questions carefully and choose the right answer:

1. A rectangular sheet of aluminum of dimensions 50cm × 16cm is folded along its length to form a cylindrical container and a base is added to it later. If there was an overlap of 12% while folding it what is the volume (in cm3) of the can?

A. 2436 B. 2464 C. 3246 D. 2250 E. 2568

2. A metallic solid box of dimensions 0.15 m × 0.44 m × 0.2 m is melted to form a wire of diameter 1 cm and length k m. If there is a loss of 20% metal in the process, what is the value of k?

A. 168 B. 128.4 C. 162.5 D. 134.4 E. 154.2

3. A solid metal box of dimension 16 cm × 22 cm × 18 cm is melted and recast into N spherical metal bearings of diameter 1cm. What is the value of N?

A. 5376 B. 7168 C. 10752 D. 12096 E. 2688

4. Two cylindrical tanks, A and B, have their circular cross section radii in the ratio 4 : 5. Equal amount of water is filled in both of them. Height of water level in A is what percentage of water level in B?

A. 625% B. 500% C. 156.25% D. 160.5% E. 112.25%

5. Metal pieces are filled in a solid metallic cylinder with internal radius 15cm, height 32.6cm and a constant thickness of 1.2 cm at walls and base, and put in a furnace. Molten metal is then used to make coins of thickness of 1.1 cm and radius 5 cm. What is the number of coins made, if molten metal level is 5 cm below the top surface of cylinder?

A. 196 B. 216 C. 264 D. 172 E. 168

6. Radius of a cone is same as that of a cylinder the area of whose base is 616 cm2 and the height of which is 13 cm. If the height of the cone is 24 cm, then find the difference between volume of cone and cylinder.

A. 3080 cm3 B. 3120 cm3 C. 3240 cm3 D. 2880 cm3 E. 2960 cm3

7. Radius and height of a conical tank is 16 m and 30 m respectively. Find the cost of painting the curved surface area of the tank at the rate of Rs. 4 per m2. [Take π = 3]

A. Rs. 6438 B. Rs. 6244 C. Rs. 6528 D. Rs. 6618 E. Rs. 6348

8. A tank has dimensions 99 cm × 120 cm × 80 cm and it is to be filled by a cylindrical bucket of height 20 cm and radius 12 cm. How many minimum times the bucket needs to be filled to completely fill the tank if the bucket can be filled up to 75% of its height?

A. 105 B. 120 C. 140 D. 150 E. None of these

9. A solid cylinder of radius 3 m and height 1.4 m is melted to form rectangular sheets of size 90 cm × 80 cm with thickness ranging from 2 cm to 5 cm. What is the difference between the maximum and minimum number of sheets that can be made?

A. 1250 B. 1650 C. 1820 D. 2250 E. 1850

10. A cylindrical tank of radius 16 cm and height 23 cm is filled up to a height of 'x' cm. When 312 metal balls of radius 2 cm are dropped in the tank the water level reaches the top of the tank. What is the value of x?

A. 15 B. 17 C. 12 D. 10 E. 13

Correct Answers:

1	2	3	4	5	6	7	8	9	10
B	D	D	C	B	A	C	C	B	D

Explanations:

1. As the sheet is folded along the length and there is an overlap of 12%, the perimeter of the base of the container = 88% (50) = 44 cm

$2\pi r = 44$ cm $\rightarrow r = 7$ cm

Height of the container = 16 cm

Volume = $\pi r^2 h = (22/7) \times 7 \times 7 \times 16 = 2464$ cm3

Hence, option B is correct.

2. Dimensions of box = 15cm × 44cm × 20cm

Radius = 1/2 cm

Volume of wire = $\pi r^2 h = (22/7) \times (1/2) \times (1/2) \times k$

There is loss of 20% metal

Volume of wire = (8/10) × Volume of box

$(22/7) \times (1/2) \times (1/2) \times k = (8/10) \times 15 \times 44 \times 20$

K = 13440 cm = 134.4 m

Hence, option D is correct.

3. As the volume remains same

Volume of box = N × Volume of one bearing

$L \times B \times H = N \times (4/3) \pi r^3$

$16 \times 22 \times 18 = N \times (4/3) \times (22/7) \times (1/2)^3$

N = 12096

Hence, option D is correct.

4. Let the water level in them be LA and LB respectively.

Let the radii of them be 4r and 5r, then volume of water would be π(4r)2LA and π(5r)2LB respectively.

Since equal amount of water has been poured in both of them, we must have

π(4r)2LA = π(5r)2LB

16LA = 25LB

$$\frac{LA}{LB} = \frac{25}{16}$$

In percentage = (LA/LB) × 100 = (25/16) × 100 = 156.25%

Hence, option C is correct.

5. Height of molten metal from the base = 32.6 – 5 = 27.6 cm

The thickness of the base of cylinder = 1.2 cm

So, total height of molten metal = 27.6 – 1.2 = 26.4 cm

Volume of molten metal = $\pi r^2 h = \pi(15)^2 \times 26.4$

Volume of one coin = $\pi r^2 h = \pi(5)^2 \times 1.1$

Number of coins = $[\pi(15)^2 \times 26.4\ ] / [\pi(5)^2 \times 1.1]$

= 216

Hence, option B is correct

6.

Radius of cylinder = $\sqrt{\frac{616}{(22/7)}}$ = 14 cm

Volume of cylinder = area of base × height = 616 × 13 = 8008 cm^3

Volume of cone = (1/2) × (22/7) × 14 × 14 × 24 = 4928 cm^3

Difference = 8008 – 4928 = 3080 cm^3

Hence, option A is correct.

7. Slant height of tank = $\sqrt{(16^2 + 30^2)} = \sqrt{(256 + 900)} = \sqrt{1156} = 34$ cm

Required cost = $3 \times 16 \times 34 \times 4$ = Rs. 6528

Hence, option C is correct.

8. Maximum volume of water in bucket

= $(3/4) \times \pi r2h$

= $(3/4) \times (22/7) \times 12 \times 12 \times 20 = (47520/7)$ cm^3

Volume of tank = $99 \times 120 \times 80$

Number of times buckets need to be filled

= $(99 \times 120 \times 80 \times 7)/47520 = 140$

Hence, option C is correct.

9. Volume of cylinder = $\pi r^2 h$ and Volume of sheet = $L \times B \times H$

The number of sheets will be maximum when thickness is minimum and minimum when thickness is maximum.

Number of sheets = $\dfrac{\pi r^2 h}{L \times B \times H}$

N min = $\dfrac{22}{7} \times \dfrac{300 \times 300 \times 140}{(80 \times 90 \times 5)} = 1100$

N max = $\dfrac{22}{7} \times \dfrac{300 \times 300 \times 140}{(80 \times 90 \times 2)} = 2750$

Required difference = 2750 – 1100 = 1650

Hence, option B is correct.

10.

Total volume of tank = Volume of water initially + Volume of balls dropped

Volume of balls dropped = Volume empty in the tank

$$312 \times \frac{4}{3}\pi r^3 = \pi R^2 (23 - x)$$

x = 10 cm

Hence, option D is correct