

Volume and Surface Area Questions for Competitive Exams Pdf

1. From a cube of side 8m, a square hole of 3m side is hollowed from end to end. What is the volume of the remaining solid?

- (A) 400 m³
- (B) 420 m³
- (C) 440 m³
- (D) 480 m³

Ans: C

Volume of the remaining solid

= Volume of the cube – Volume of the cuboid cut out from it

$$= [(8 \times 8 \times 8) - (3 \times 3 \times 8)]\text{m}^3 = (512 - 72)\text{m}^3 = 440 \text{ m}^3$$

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2. Each side of a cube measures 8 metres. What is the volume of the cube?

- (A) 72 cu.m
- (B) 172 cu.m
- (C) 196 cu.m
- (D) 512 cu.m.

Ans: D

Volume of the cube = 8³ cu.m = 512 cu.m.

3. The dimensions of a cuboid are 7 cm, 11 cm and 13 cm. The total surface area is

- (A) 311 cm²
- (B) 411 cm²

(C) 622 cm^2

(D) 722 cm^2

Ans: C

Surface area = $[2(7 \times 11 + 11 \times 13 + 7 \times 13)] \text{ cm}^2$

= $(2 \times 311) \text{ cm}^2 = 622 \text{ cm}^2$.

4. The surface area of a cube is 150 cm^2 . Its volume is

(A) 64 cm^3

(B) 94 cm^3

(C) 125 cm^3

(D) 135 cm^3

Ans: C

$6a^2 = 150 \Rightarrow a^2 = 25 \Rightarrow a = 5$.

$\therefore \text{Volume} = a^3 = 5^3 \text{ cm}^3 = 125 \text{ cm}^3$.

5. A boat having a length 3 m and breadth 2 m is floating on a lake. The boat sinks by 1 cm when a man gets on it. The mass of man is

(A) 42 kg

(B) 50 kg

(C) 60 kg

(D) 72 kg

Ans: C

Volume of water displaced = $(3 \times 2 \times 0.01) \text{ m}^3 = 0.06 \text{ m}^3$

$\therefore \text{Mass of man} = \text{Volume of water displaced} \times \text{Density of water}$

= $(0.06 \times 1000) \text{ kg} = 60 \text{ kg}$.

6. A rectangular plot measuring 90 metres by 50 metres is to be enclosed by wire fencing. If the poles of the fence are kept 5 metres apart, how many poles will be needed?

- a. 55
- b. 56
- c. 57
- d. 58

Ans: B

Perimeter of the plot = $2(90 + 50) = 280$ m.

$$\therefore \text{Number of poles} = \left(\frac{280}{5}\right) = 56$$

7. The ratio between the length and the breadth of a rectangular park is 3 : 2. If a man cycling along the boundary of the park at the speed of 12 km/hr complete one round in 8 minutes, then the area of the park (in sq.m) is

- a. 15360 sq.m
- b. 153600 sq.m
- c. 30720 sq.m
- d. 307200 sq.m

Ans: B

Perimeter = Distance covered in 8 min.

$$= \left(\frac{12000}{60} \times 8\right) \text{m} = 1600 \text{ m.}$$

Let length = $3x$ metres and breadth = $2x$ metres.

Then, $2(3x + 2x) = 1600$ or $x = 160$.

Length = 480 m and Breadth = 320 m.

$$\therefore \text{Area} = (480 \times 320) \text{ m}^2 = 153600 \text{ m}^2.$$

8. How many metres of carpet 63 cm wide will be required to cover the floor of a room 14 m by 9 m?

- a. 185 m
- b. 200 m
- c. 210 m
- d. 220 m

Ans: B

$$\text{Area of the floor} = (14 \times 9) \text{ m}^2 = 126 \text{ m}^2.$$

$$\therefore \text{Length of the carpet} = \left(\frac{126}{63} \times 100 \right) \text{ m} = 200 \text{ m}$$

9. A room 5 m and 8 m is to be carpeted leaving a margin of 10 cm from each wall. If the cost of the carpet is Rs. 18 per sq.metre, the cost of carpeting the room will be

- a. Rs. 673.92
- b. Rs. 682.46
- c. Rs. 691.80
- d. Rs. 702.60

Ans: A

$$\text{Area of the carpet} = [(5 - 0.20) \times (8 - 0.20)] \text{ m}^2 = (4.8 \times 7.8) \text{ m}^2 = 37.44 \text{ m}^2.$$

$$\therefore \text{Cost of carpeting} = ₹ (37.44 \times 18) = ₹ 673.92.$$

10. A garden is 24 m long and 14 m wide. There is a path 1 m wide outside the garden along its sides. If the path is to be constructed with square marble tiles 20 cm x 20 cm, the number of tiles required to cover the path is

- a. 200
- b. 1800
- c. 2000
- d. 2150

Ans: C

$$\text{Area of the path} = [(26 \times 16) - (24 \times 14)] \text{ m}^2 = (416 - 336) \text{ m}^2 = 80 \text{ m}^2.$$

∴ Number of tiles required to cover the path

$$= \frac{\text{Area of path}}{\text{Area of each tile}} = \left(\frac{80 \times 100 \times 100}{20 \times 20} \right) = 2000.$$

11. Three plots having areas 110, 130 and 190 square metres are to be subdivided into flower beds of equal size. If the breadth of a bed is 2 metre, the maximum length of a bed can be

- a. 5 m
- b. 11 m
- c. 13 m
- d. 19 m

Ans: A

Maximum possible size of a flower bed = (H.C.F of 110, 130, 190) sq. m = 10 sq. m

$$\therefore \text{Maximum possible length} = \left(\frac{10}{2} \right) \text{ m} = 5 \text{ m}.$$

12. In a shower, 5 cm of rainfalls. The volume of water that falls in 1.5 hectares of ground is

- a. 75 cu.m
- b. 750 cu.m
- c. 7500 cu.m
- d. 75000 cu.m → B

Ans:

$$\text{Area} = (1.5 \times 10000) \text{ m}^2 = 15000 \text{ m}^2. \text{ Depth} = \frac{5}{100} \text{ m} = \frac{1}{20} \text{ m}.$$

$$\therefore \text{Volume} = (\text{Area} \times \text{Depth}) = \left(15000 \times \frac{1}{20}\right) \text{ m}^3 = 750 \text{ m}^3.$$

13. The length of the longest rod that can be placed in a room of dimensions 10 m \times 10 m \times 5 m is

(a) $15\sqrt{3}$

(b) 15

(c) $10\sqrt{2}$

(d) $5\sqrt{3}$

Ans:

$$\text{Required length} = \sqrt{(10)^2 + (10)^2 + (5)^2} \text{ m} = \sqrt{225} \text{ m} = 15 \text{ m}.$$

14. If a river 2.5 m deep and 45 m wide is flowing at the rate of 3.6 km per hour, then the amount of water that runs into the sea per minute is

a. 6650 cu.m

b. 6750 cu.m

c. 6850 cu.m

d. 6950 cu.m \rightarrow

Ans:

Length of water column flown in 1 min

$$= \left(\frac{3.6 \times 1000}{60}\right) \text{ m} = 60 \text{ m}.$$

$$\therefore \text{Volume flown per minute} = (60 \times 45 \times 2.5) \text{ m}^3 = 6750 \text{ m}^3.$$

15. How many cubes of 3 cm edge can be cut out of a cube of 18 cm edge?

a. 36

b. 216

c. 218

d. 432 →

Ans:

$$\text{Number of cubes} = \left(\frac{18 \times 18 \times 18}{3 \times 3 \times 3} \right) = 216.$$

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