QB365

Important Questions - Surface Areas and Volumes

9th Standard CBSE

Mathematics Reg.No. : | | | | | | |

Time : 01:00:00 Hrs

Total Marks : 50

Section-A

1) Which of the following is a plane figure? **1**

(a) Cone (b) Square (c) Cylinder (d) Cube.

2) Which of the following is a solid figure? **1**

(a) Circle (b) Cylinder (c) Square (d) Rectangle.

3) Identify the wrong statement of the following: **1**

(a) A square can be drawn on our notebook. (b) A circle can be drawn on the blackboard.

(c) A rectangle can be drawn on a piece of paper. (d) A triangle cannot be drawn on a wall.

4) The number of edges of a cube are **1**

(a) 6 (b) 8 (c) 12 (d) 16.

5) If the edges of a cuboid are l, b and h respectively, then the total surface area of the cuboid is **1**

(a) 2(lb + bh + hl) (b) lbh (c) 2(l + b)h (d) none of these.

6) The lateral surface area of a cuboid of length l, breadth b and height h is **1**

(a) 2(lb + bh + hl) (b) 2(l + b)h (c) lbh (d) none of these.

7) The side of a cube is 1 cm. The total surface area of the figure formed by joining two such cubes is **1**

(a) $2(2 + 1 + 2)\ cm^2$ (b) $2(2 + 2 + 2)\ cm^2$ (c) $2(1 + 1 + 1)\ cm^2$ (d) $2(1 + 1 + 2)\ cm^2$

8) A brick measures 25 cm $\times$ 12 cm $\times$ 10 cm. Its surface area is **1**

(a) $670\ cm^2$ (b) $1340\ cm^2$ (c) $3000\ cm^2$ (d) $1500\ cm^2$

9) The area of the four walls of a room is 300 m^2. Its length and height are 15 m and 6 m respectively. Find its breadth. **1**

(a) 10 m (b) 5 m (c) 20 m (d) 15 m

10) The area of the four walls of a room is 80 cm^2 and its height is 4 m. Then, the perimeter of the floor of the room is **1**

(a) 16 m (b) 5 m (c) 20 m (d) 10 m

Section-B

11) The edge of a cube is 10.5 mm. Find its total surface area in cm^2. **2**

12) The length, breadth, and height of a cuboid are 15 cm, 10 cm, and 20 cm. Find the surface area of the cuboid. **2**

13) The surface area of a cuboid is 1372 cm^2.If its dimensions are in the ratio 4: 2: 1, find its length. **2**

14) The floor of a rectangular hall has a perimeter of 250 m and its length and breadth are in the ratio of 13: 12. If the cost of painting the four walls and ceiling at the rate of Rs. 5 per m^2 is Rs.27000, find the height of the hall. **2**

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15) The diameter of a circular wall is 4.5 m and its depths is 14 m.Find the cost of cementing the inner surface of the wall at Rs. 120 per sq. m. **2**

16) How many metres of cloth $1\frac{4}{7}m$ wide will be 7 required to make a conical tent whose base diameter is 10 m and whose vertical height is 12 cm? **2**

17) Find the volume, total surface area, lateral surface area and the length of diagonal of a cube, each of whose edges measures 20 cm. **2**

18) A village having a population of 2000, requires 150 litres of water per head per day. It has a tank measuring 20 m $\times$ 15 m $\times$ 6 m. Find how many days will the water of this tank last? **2**

19) The volume of a cylinder is 448π cubic cm and the height is 7 cm. Find its total surface area. **2**

20) Find the capacity in litres of a conical vessel whose base diameter is 14 cm and slant height is 25 cm. **2**

Section-C

21) A cast-iron pipe has an external diameter of 75 mm. If it is 4.2 m long, find the area of the outer surface. $\left[Assume\pi = \frac{22}{7}\right]$ **5**

22) Find the length of the longest rod that can be placed in a room 12 m $\times$ 9 m $\times$ 8 m. **5**

23) A powder tin has a square base with side 8 cm and height 13 cm. Another is cylindrical with the radius of its base 47 cm and its height 15 cm. Find the difference in their capacities. (Use $\pi = \frac{22}{7}$) **5**

24) The difference between outside and surface of a cylindrical metallic pipe 14 cm long is 44 cm^2. If the pipe is made of 99 cm^3 of metal, find the outer and inner radii of the pipe. **5**

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Section-A

1) (b) Square **1**

2) (b) Cylinder **1**

3) (d) A triangle cannot be drawn on a wall. **1**

4) (c) 12 **1**

5) (a) 2(lb + bh + hl) **1**

6) (b) 2(l + b)h **1**

7) (a) 2(2 + 1 + 2) cm^2 **1**

8) (b) 1340 cm^2 **1**

9) (a) 10 m **1**

10) (c) 20 m **1**

Section-B

11) 6.615 cm^2 **2**

12) 1300 cm^2 **2**

13) 28 cm **2**

14) 21.6 m **2**

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15) Rs. 23760 **2**

16) 130 m **2**

17) 8000 cm^3, 2400 cm^2, 1600 cm^2, $20\sqrt{3}$ cm **2**

18) 6 days **2**

19) 240 π cm^2 **2**

20) 1.283 l **2**

Section-C

21) External diameter = 75 mm **5**

$\therefore$ External radius (r) $= \frac{75}{2}mm = 37.5mm$

$= \frac{37.5}{10}cm = 3.75cm$

Length of the pipe (h)

= 4.2 m = 4.2 $\times$ 100 cm = 420 cm

$\therefore$ Area of the outer surface = $2\pi rh$

$= 2 \times \frac{22}{7} \times 3.75 \times 420 = 9900cm^2$.

22) For room **5**

l = 12 m,

b = 9 m,

h = 8 m

$\therefore$ Length of the longest rod that can be placed in the room

= Length of the diagonal

$= \sqrt{l^2 + b^2 + h^2}$

$= \sqrt{(12)^2 + (9)^2 + (8)^2}$

$= \sqrt{144 + 81 + 64}$

$= \sqrt{289}$

$= 17m.$

23) For a power tin with a square base **5**

Side of the square base =8 cm

Height =13 cm

$\therefore$ Volume (v_1)=8 x 8 x 13=832 cm^2

For a cylindrical powder tin

Radius of the base (r)=7 cm

Height (h)=15 cm

$\therefore$ Volume (v_2)=$\pi r^2 h$

$= \frac{22}{7} \times (7)^2 \times 15 = 2310\ cm^3$

$\therefore$ Difference in their capacities =v_2-v_1

=2310-832=1478 cm^3

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24) Let the outer and inner radii of the pipe be R cm and r cm respectively, then,

$2\pi R(14) - 2\pi r(14) = 44$

$\Rightarrow \quad 8\pi(R - r) = 44$

$\Rightarrow \quad 28 \times \frac{22}{7}(R - r) = 44$

$= R - r = \frac{1}{2}$

and $\pi R^2(14) - \pi r^2(14) = 99$

$\Rightarrow \quad 14\pi(R^2 - r^2) = 99$

$\Rightarrow \quad 14 \times \frac{22}{7}(R^2 - r^2) = 99$

$\Rightarrow \quad R^2 - r^2 = \frac{9}{4}$

$\Rightarrow \quad (R + r)(R - r) = \frac{9}{4}$

$\Rightarrow \quad (R + r)\frac{1}{2} = \frac{9}{4}$

Solving (1) and (2) we get

$R = \frac{5}{2}cm$

r=2 cm

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