TEXT BOOK EXERCISE 9.5

Q. 1. Find the volume of a cuboid having dimension

(*i*) 4m, 3m, 5m

(*ii*) 12 cm, 8 cm, 10 cm,

(*iii*) 1.5 cm, 2m, 3.4 m

Solution. (*i*) Here, $l = 4$ m, $b = 3$ m, $h = 5$ m

$\therefore$ Volume of the cuboid

$= l \times b \times h = 4 \times 3 \times 5$ m^3

$= 60$ m^3 **Ans.**

(*ii*) Here, $l = 12$ cm, $b = 8$ cm, $h = 10$ cm

$\therefore$ Volume of the cuboid

$= l \times b \times h$

$= 12 \times 8 \times 10$ cm^3

$= 960$ cm^3 **Ans.**

(*iii*) Here, $l = 1.5$ m, $b = 2$ m, $h = 3.4$ m

$\therefore$ Volume of the cuboid

$= l \times b \times h = 1.5 \times 2 \times 3.4$ m^3

$= 10.2$ m^3

Q. 2. Find the volume of a cube having edge :

(*i*) 6 cm (*ii*) 12 cm (*iii*) 1.5 m

Solution. (*i*) Edge of the cube (l) = 6 cm

$\therefore$ Volume of cube

$= (l)^3 = (6)^3$ cm$^3 = 216$ cm^3

(*ii*) Edge of the cube (h) = 12 cm

Volume of the cube

$= (l)^3 = (12)^3$ cm$^3 = 1728$ cm^3

(*iii*) Edge of the cube (l) = 1.5 m

Volume of cube

$= (l)^3 = (1.5)^3$ m^3

$= 3.375$ m^3 **Ans.**

Q. 3. Find the volume of cuboid whose area of base is 24 cm^2 and height is 3 cm.

Solution. Area of base of cuboid = 24 cm^2

Height (h) of cuboid

$= 3$ cm

Volume of cuboid
= Area of base × height
= 24×3 cm^3 = 72 cm^3 **Ans.**

Q. 4. By doubling the side of cube, how many times (*a*) its surface area becomes (*b*) its volume becomes.

Solution. Let the edge of the cube = x cm
∴ Surface area of cube
= 4 (side)^2 = 4 $(x)^2$ cm^2
= $4x^2$ cm^2
Also volume of cube
= (side)^3 = x^3 cm^3
(*a*) When length of side of cube is doubled then side of new cube = $2x$
∴ New surface area = 4 $(2x)^2$ cm^2
= $4 \times 4x^2$ cm^2 = $16x^2$ cm^2
= 4 $(4x^2)$ = 4 × Surface area of original cube
Hence, if the side of the cube is doubled surface area increases, four times.
(*b*) New volume of the cube = (side)^3
= $(2x)^3$ cm^3
= $8x^3$ cm^3
= 8 × volume of original cube
Hence, if the side of the cube is doubled then its volume increases eight times.

Q. 5. Find the height of a cuboid whose volume is 275 cm^3 and base area is 25 cm^2.

Solution. Let height of cuboid = h cm
Base area of cube = 25 cm^2
Volume of cuboid = 275 cm^2
∴ Base area × height = 275
$25 \times h = 275$

$$\Rightarrow \quad h = \frac{275}{25} = 11 \text{ cm}$$

Hence, height of cube = 11 cm **Ans.**

Q. 6. A godown is in the form of a cuboid of measure 60 m × 32 m × 30 m. How many cuboidal boxes can be stored in it if the volume of one box is 8 m^3 ?

Solution. Volume of the cuboidal godown
= 60 m × 32 m × 30 m
= 57600 m^3
Volume of one box = 8 m^3
Number of cuboidal boxes

$$= \frac{\text{Volume of cuboidal godown}}{\text{Volume of each box}}$$

$$= \frac{57600}{8} = 7200 \text{ Ans.}$$

Q. 7. Find the volume of a cylinder whose :
(*i*) r = 7 cm, h = 12 cm
(*ii*) r = 3.5 cm, h = 15 cm
(*iii*) r = 14 m, h = 10 m.

Solution. (*i*) Here, r = 7 cm, h = 12 cm
∴ Volume of cylinder

$$= \pi r^2 h = \frac{22}{7} \times 7 \times 7 \times 12 \text{ cm}^3$$

= 1848 cm^3 **Ans.**
(*ii*) Here, r = 3.5 cm, h = 15 cm
∴ Volume of cylinder = $\pi r^2 h$

$$= \frac{22}{7} \times 3.5 \times 3.5 \times 15 \text{ cm}^3$$

= 577.5 cm^3 **Ans.**
(*iii*) Here, r = 14 cm, h = 10 m
∴ Volume of cylinder = $\pi r^2 h$

$$= \frac{22}{7} \times 14 \times 14 \times 10 \text{ m}^3$$

= 6160 m^3 **Ans.**

Q. 8. Find the height of the cylinder whose volume is 1.54 m^3 and whose diameter of the base is 140 cm.

Solution. Diameter of the base of the cylinder = 140 cm
Radius of the cylinder

$$= \frac{140}{2} \text{m} = 70 \text{ cm} = 0.70 \text{ m}$$

Let height of the cylinder = h m
Volume of the cylinder = 1.54 m^3
∴ $\pi r^2 h = 1.54$

$$\Rightarrow \frac{22}{7} \times 0.7 \times 0.7 \times h = 1.54$$

$$\Rightarrow 1.54\, h = 1.54$$

$$\Rightarrow \quad h = \frac{1.54}{1.54} = 1$$

Hence, height of the cylinder = 1 m **Ans.**

Q. 9. Find the volume of a cylinder having base area 1.54 m^2 and height 3.5 m.

Solution. Base area of the cylinder = 1.54 m^2

Height (h) of the cylinder = 3.5 m

$\therefore$ Volume of the cylinder = Base area × height

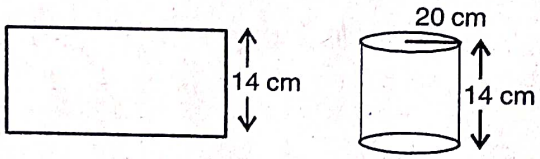
$= 1.54 \times 3.5\ m^3$

$= 5.39\ m^3$ **Ans.**

Q. 10. A rectangular paper of width 14 cm is rolled along its width and a cylinder of radius 20 cm is formed. Find the volume of the cylinder.

Solution. A cylinder is formed by rolling a rectangle about its width.

Hence, the width of the paper becomes height and radius of the cylinder is 20 cm.



Height of the cylinder = h = 14 cm

Radius = r = 20 cm

$\therefore$ Volume of cylinder

$= V = \pi r^2 h$

$= \frac{22}{7} \times 20 \times 20 \times 14\ cm^3$

$= 17600\ cm^3$

Hence, the volume of the cylinder

$= 17600\ cm^3$ **Ans.**

Q. 11. Water is pouring into a cuboidal reservoir at the rate of 60 litres per minutes. If the volume of reservoir is 108 m^3, find the number of hours it will take to fill up reservoir.

Solution. Volume of reservoir = 108 m^3

$= 108 \times 1000$ litres

$[\because\ 1\ m^3 = 1000$ litres$]$

$= 108000$ litres.

The rate of water pouring in the reservoir

$= 60$ litres per minute

$= 60 \times 60$ litre per hour

$= 3600$ litres per hour

Hence, time taken to fill the reservoir

$= \frac{\text{Volume}}{\text{Rate}} = \frac{108000}{3600}$ h

$= 30$ h **Ans.**

Q. 12. Multiple Choice Questions :

(*i*) Find the area of base of a cylinder.

(*a*) $\pi r^2 h$ (*b*) πr^2

(*c*) $2\pi rh$ (*d*) $2\pi r$.

(*ii*) Find the volume of a cuboid having dimension $4m \times 2.5\ m \times 2m$

(*a*) 20 m^3 (*b*) 40 m^3

(*c*) 30 m^3 (*d*) 200 m^3.

(*iii*) If edge of cube is doubled then what will happen to its volume ?

(*a*) Double (*b*) 4 times

(*c*) 8 times (*d*) 6 times.

(*iv*) 1 l = ... cm^3

(*a*) 1000 (*b*) 100

(*c*) 10 (*d*) l.

(*v*) The volume of a cube with edge 1.1 is :

(*a*) 13.31 (*b*) 1.331

(*c*) 133.1 (*d*) 1331.

Ans. (*i*) (*b*) πr^2 (*ii*) (*a*) 20 m^3

(*iii*) (*c*) 8 times (*iv*) (*a*) 1000

(*v*) (*b*) 1.331.

Objective Type Questions

1. Multiple Choice Questions :

(*i*) If the diagonals of a rhombus are 7.5 cm and 12 cm, then its area will be :

(*a*) 24 cm^2 (*b*) 36 cm^2

(*c*) 45 cm^2 (*d*) 48 cm^3.

Ans. (*c*) 45 cm^2.

(*ii*) Which of the following can be the unit of area ?

(*a*) m (*b*) cm

(*c*) cm^2 (*d*) mm.

Ans. (*c*) cm^2.

(iii) Surface area of a cuboid is :

(a) lbh (b) $2(lb + bh + hl)$

(c) $(l + b + h)$ (d) $2(l + b) \times h$.

Ans. (b) $2(lb + bh + hl)$.

(iv) Surface area of a cube of edge l is :

(a) l^2 (b) $2l^2$

(c) $4l^2$ (d) $6l^2$.

Ans. (d) $6l^2$.

(v) The curved surface area of a cylinder is :

(a) $2\pi rh$ (b) $2\pi r^2h$

(c) πrh (d) πr^2h.

Ans. (a) $2\pi rh$.

(vi) The volume of a cuboid will be :

(a) $l + b + h$

(b) $l^2 + b^2 + h^2$

(c) $l \times b \times h$

(d) $2(l + b) \times h$.

Ans. (c) $l \times b \times h$.

(vii) Volume of a cube will be :

(a) $6l^2$ (b) $4l^2$

(c) l^3 (d) $6l$.

Ans. (c) l^3.

(viii) What will be the volume of a cylinder ?

(a) $2\pi rh$ (b) πr^2

(c) πr^2h (d) $\frac{1}{3}\pi r^2h$.

Ans. (c) πr^2h.

(ix) Volume of a cubical vessel is one litre. The length of the edge of cube is :

(a) 1 cm (b) 1 m

(c) 10 cm (d) 1 mm.

Ans. (c) 10 cm.

(x) If a and b are the sides of a trapezium and h is the perpendicular distance between them, then area of the trapezium will be :

(a) $\frac{1}{2} \times a \times b \times h$

(b) $\frac{1}{2}(a + b) \times h$

(c) $\frac{1}{2}(a - b) \times h$

(d) $(a + b) \times h$.

Ans. (b) $\frac{1}{2}(a + b) \times h$.

2. Choose True/False for the following questions :

(i) The distance covered around the boundary of a closed plane figure is called its perimeter. (True/False)

Ans. True.

(ii) The region enclosed by a plane closed figure is called its area. (True/False)

Ans. True.

(iii) Area of a rhombus is half the product of its diagonals. (True/False)

Ans. True.

(iv) The area of a rhombus with diagonals 10 cm and 8.2 cm is 40 cm^2. (True/False)

Ans. False.

(v) Lateral surface area of a cylinder is πrh. (True/False)

Ans. False.

3. Fill in the blanks :

(i) Area of a trapezium

$= \frac{\text{..... of parallel sides}}{2} \times$ perpendicular distance between them

Ans. Sum.

(ii) Area of a rhombus = Half the ..... of its diagonals.

Ans. product.

(iii) Surface area of a solid is the sum of the area of its ..... .

Ans. faces.

(iv) Amount of region occupied by a solid is called its ..... .

Ans. volume.

(v) 1 litre = ... cm^3

Ans. 1000.