

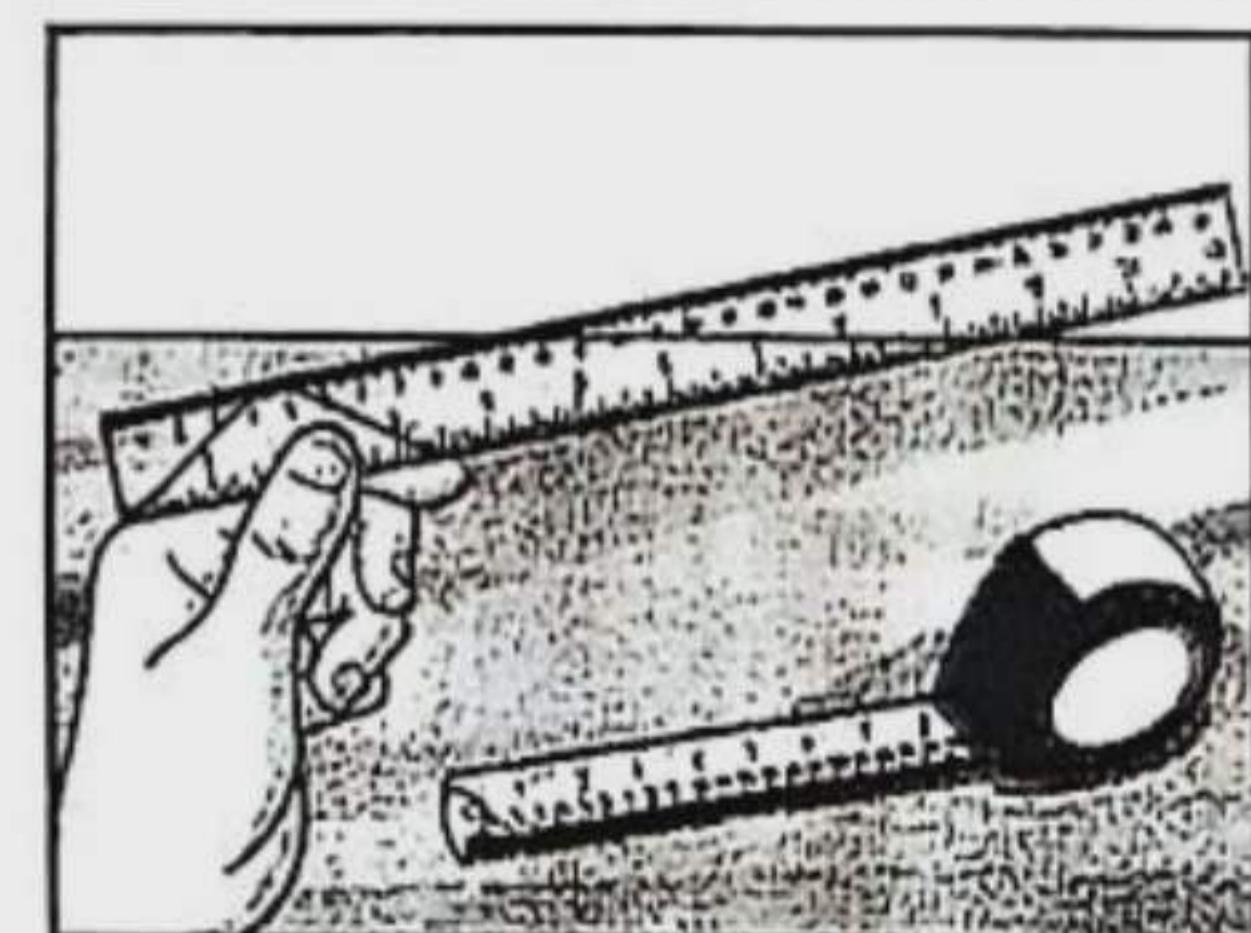
# Measurement

## Contents for Discussion

- Concept of Measurement and Units
- Measurement in Metric System
- The units of measuring length
- Relation between British and Metric System
- Measurement of Weights
- Measurement of Volume of Liquids
- Measurement of Area
- Volume.

**Learning Outcomes :** After studying this chapter I will be able to—

- Explain national, British and international systems of measurement and solve problems involving determination of length, area, weight, volume of liquid by related systems.
- Measure by the daily used scales in national, British and international systems.



## Practice



**Solutions to Mathematical Problems following  
100% accurate format for best prep.**

Dear learners, mathematical problems of this chapter have been divided into exercise, multiple choice, short, creative and exercise-based activities in light of the learning outcomes. Practice the solutions well to ensure the best preparation in the exam.

## At a Glance Important Contents of Chapter

- The unit of length measurement is meter.
- **Metric units of length measurement :**

10 m. Mr. = 1 s. Mr. (Centimeters)	10 m. = 1 deka. Mr. (decameter)
10 s. Mr. = 1 deci. Mr. (decimeter)	10 Dec. Mr. = 1 ha. Mr. (Hectometer)
10 Dec. Mr. = 1 m. (Meters)	10 Hectometer = 1 Ki. Mr. (kilometers)
- **Relationship between metric and British system of length measurement :**

1 meter = 39.37 inches (approx.)	1 inch = 2.54 cm. Mr. (approx.)
1 what. Mr. = 0.62 miles (approx.)	1 mile = 1.6 kilometers (approx.)
- Gram is the unit of weight measurement.
- **Metric units of measurement of weight :**

100 kilograms (kg.) = 1 quintal	1000 kilograms or 10 quintals is 1 metric ton
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- **British units of area measurement :**

144 square inches = 1 square foot	4840 square yards = 1 acre
9 square feet = 1 square yard	100 cents (decimal) = 1 acre
- **Relationship between metric and British system of area measurement :**

1 square centimeter = 0.16 square meters (approx.)	1 square feet = 929 square centimeters (approx.)
1 square meter = 10.76 square feet (approx.)	1 square yard = 0.84 square meters (approx.)
1 hectare = 2.47 acres (approx.)	1 square mile = 640 acres
- A liter is a unit of measure for the volume of a liquid.
 

10 milliliters = 1 centiliter	10 liters = 1 deciliter
10 centiliters = 1 deciliter	10 deciliters = 1 hectoliter
10 deciliter = 1 liter	10 hectoliter = 1 kiloliter
- **Measurement of Area :** Area of rectangle = Length × Breadth  
 Area of square =  $(\text{Length of one side})^2$   
 Area of triangle =  $\frac{1}{2} \times \text{Base} \times \text{Height}$ .



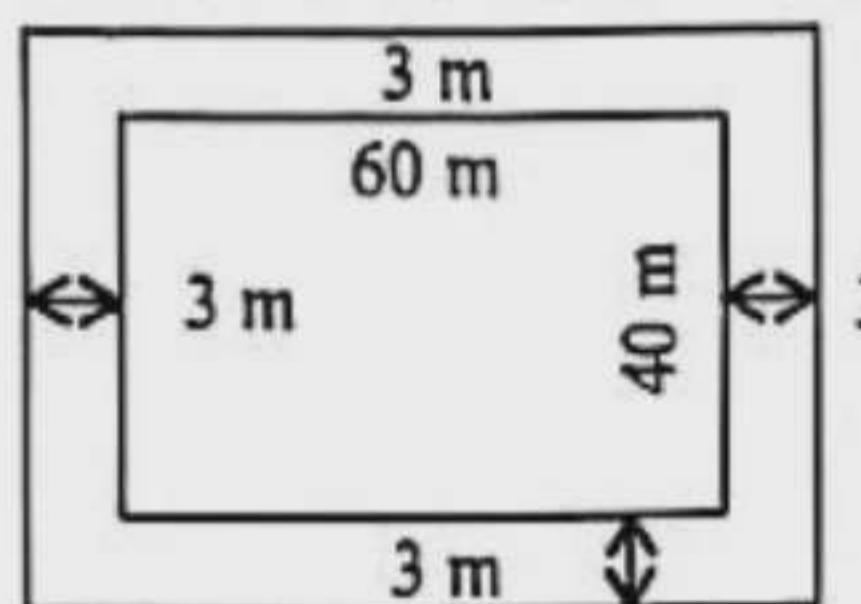
 Solutions to Mathematical Problems □

- 10.** The length of a pond is 60 metres and the breadth is 40 metres. If the breadth of its bank is 3 metres, find the area of the bank.

**Solution :**

Here, the length of the pond = 60 m

„ breadth „ „ „ = 40 m



$$\therefore \text{The area of the pond} = 60 \times 40 \text{ sq. m} \\ = 2400 \text{ sq. m}$$

Again,

$$\begin{aligned} \text{The length of the pond including bank} \\ = (60 + 2 \times 3) \text{ m} \\ = 66 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{and the breadth of the pond including bank} \\ = (40 + 2 \times 3) \text{ m} \\ = 46 \text{ m} \end{aligned}$$

$$\begin{aligned} \therefore \text{The area of the pond including bank} \\ = 66 \times 46 \text{ sq. m} \\ = 3036 \text{ sq. m} \end{aligned}$$

$$\begin{aligned} \therefore \text{The area of the bank} &= (3036 - 2400) \text{ sq. m} \\ &= 636 \text{ sq. m} \end{aligned}$$

- 11.** The area of a rectangle is 10 acres and its length is 4 times the breadth. What is the length of the rectangle in metres?

**Solution :**

$$\begin{aligned} \text{Here, } 10 \text{ acres} &= 10 \times 4046.86 \text{ sq. m} \\ &= 40468.6 \text{ sq. m} \end{aligned}$$

Let, the breadth of the land =  $x$  m

$$\therefore \text{Its length} = 4x \text{ "}$$

$$\begin{aligned} \therefore \text{Its area} &= 4x \times x \\ &= 4x^2 \text{ sq. m} \end{aligned}$$

According to question,

$$4x^2 = 40468.6$$

$$\text{or, } x^2 = 10117.15$$

$$\text{or, } x = \sqrt{10117.15}$$

$$\text{or, } x = 100.58$$

$$\therefore 4x = 402.34$$

∴ The length of the land is 402.34 metre. (Approx)

- 12.** The length of a rectangular house is one and a half time its breadth. If the area of the house is 216 sq. metres, what is its perimeter?

**Solution :**

Here, the total area of the house = 216 sq. metre

Let, the breadth of the house =  $x$  m

$$\therefore \text{length } \text{, } \text{, } \text{, } \text{, } = 1.5x \text{ "}$$

$$\begin{aligned} \therefore \text{Its area} &= 1.5x \times x \text{ sq. m} \\ &= 1.5x^2 \text{ sq. m} \end{aligned}$$

According to question,

$$1.5x^2 = 216$$

$$\text{or, } x^2 = \frac{216}{1.5} = \frac{216 \times 10}{15} = 144$$

$$\begin{aligned} \therefore x &= \sqrt{144} \\ &= 12 \end{aligned}$$

$$\therefore 1.5x = 12 \times 1.5 = 18$$

$$\begin{aligned} \therefore \text{The perimeter of the house} &= 2(\text{Length} + \text{width}) \\ &= 2(18 + 12) \text{ m} \\ &= 2 \times 30 \text{ m} \\ &= 60 \text{ m} \end{aligned}$$

- 13.** The base of a triangular region is 24 metres and the height is 15 metres 50 cm. Find its area.

**Solution :**

$$\begin{aligned} \text{Here, length of base} &= 24 \text{ m} \\ \text{height} &= 15 \text{ m } 50 \text{ cm} \\ &= 15.5 \text{ m} \end{aligned}$$

$$\text{We know the area of a triangle} = \frac{1}{2} \times \text{base} \times \text{height}$$

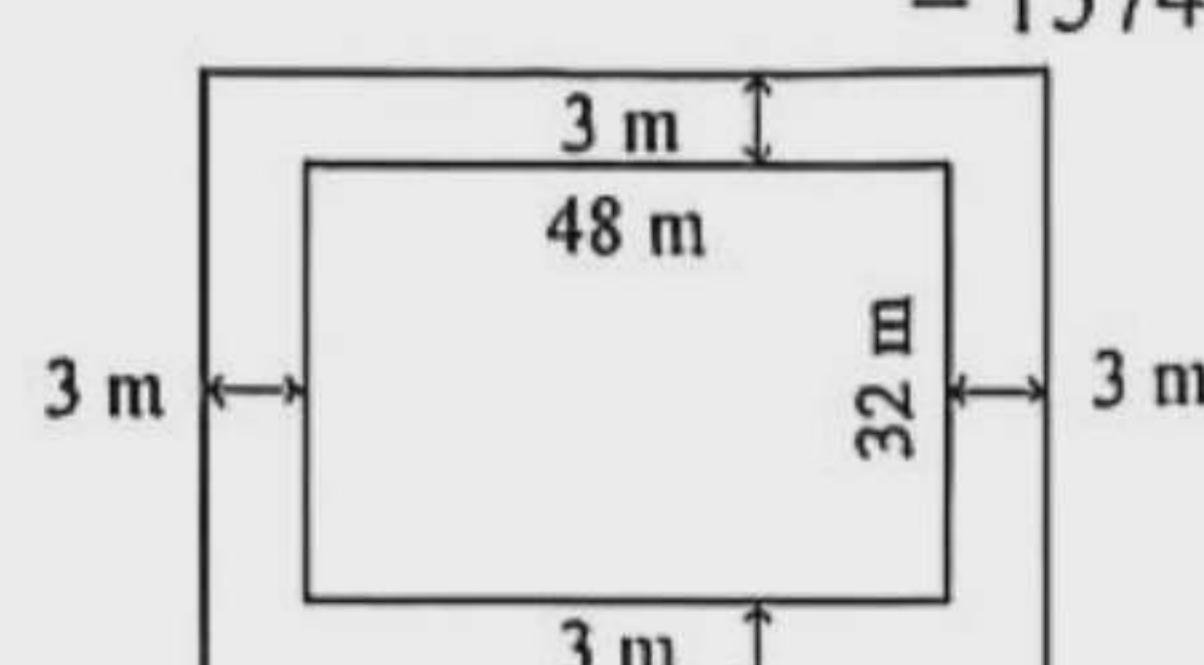
$$\begin{aligned} \therefore \text{The area of the triangle} &= \frac{1}{2} \times 24 \times 15.5 \text{ sq. m} \\ &= 12 \times 15.5 \text{ sq. m} \\ &= 186 \text{ sq. m} \end{aligned}$$

- 14.** The length of a rectangle is 48 metres and its breadth is 32 metres 80 cm. There is a 3 metres wide road around outside. What is the area of the road?

**Solution :**

$$\begin{aligned} \text{Here, length} &= 48 \text{ m} \\ \text{breadth} &= 32 \text{ m } 80 \text{ cm} \\ &= 32.80 \text{ m} \end{aligned}$$

$$\begin{aligned} \therefore \text{The area of the rectangle} &= 48 \times 32.80 \text{ sq. m} \\ &= 1574.4 \text{ sq.m} \end{aligned}$$



$$\begin{aligned} \text{Again, the length of the rectangle including the road} \\ &= 48 \text{ m} + (3 + 3) \text{ m} \\ &= 54 \text{ m} \end{aligned}$$

The width of the rectangle including the road

$$\begin{aligned} &= 32.80 \text{ m} + (3 + 3) \text{ m} \\ &= 38.80 \text{ m} \end{aligned}$$

$$\begin{aligned} \therefore \text{The area of the rectangle including the road} \\ &= 54 \times 38.80 \text{ sq. m} \\ &= 2095.2 \text{ sq. m} \end{aligned}$$

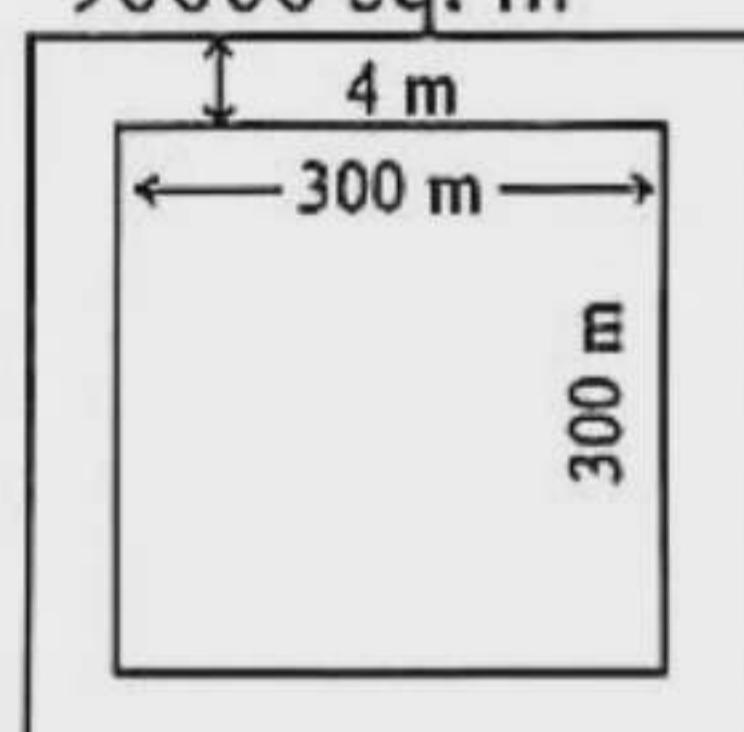
$$\begin{aligned} \therefore \text{The area of the road} &= (2095.2 - 1574.4) \text{ sq. m} \\ &= 520.8 \text{ sq. m} \end{aligned}$$



- 15.** The length of one side of a square is 300 metres and around its outside, there is a road of breadth 4 metres. Find the area of the road.

**Solution :**

Here, length of one side of the square sized = 300 m  
 $\therefore$  Its area =  $300 \times 300$  sq. m  
 $= 90000$  sq. m



$$\text{Length of the square land including road} = 300 \text{ m} + (4 + 4) \text{ m} \\ = 308 \text{ m}$$

$$\therefore \text{Its area} = 308 \times 308 \text{ sq. m} \\ = 94864 \text{ sq. m} \\ \therefore \text{The area of the road} = (94864 - 90000) \text{ sq. m} \\ = 4864 \text{ sq. m}$$

- 16. The area of a triangular land is 264 sq. metres. Find the height if the base is 22 metres.**

**Solution :**

Here, the area of the land = 264 sq. m  
 According to question, The base is = 22 m

$$\therefore 264 = \frac{1}{2} \times 22 \times \text{height}$$

$$\text{or, } 11 \times \text{height} = 264$$

$$\text{or, height} = \frac{264}{11}$$

$$\text{or, height} = 24$$

$\therefore$  The height of the land is 24 m.

- 17. A reservoir contains 19,200 litres of water. Its depth is 2.56 metres and its breadth is 2.5 metres. What is its length ?**

**Solution :** We know,

$$\begin{aligned} 1 \text{ litre} &= 1000 \text{ cc} \\ \therefore 19200 \text{ litre} &= 19200 \times 1000 \text{ cc} \\ &= 19200000 \text{ cc} \end{aligned}$$

That is, the interior volume of the water tank is 19200000 cc

Again, we have,

The depth of the tank = 2.56 m = 256 cm

The breadth of the tank = 2.50 m = 250 cm

Let, the length of the tank = x cm

$$\begin{aligned} \therefore \text{Volume} &= \text{length} \times \text{width} \times \text{depth} \\ &= 256 \times 250 \times x \text{ cc} \end{aligned}$$

According to question,

$$256 \times 250 \times x = 19200000$$

$$\begin{aligned} \text{or, } x &= \frac{19200000}{250 \times 256} \\ &= \frac{19200000}{64000} = \frac{19200}{64} = 300 \end{aligned}$$

$\therefore$  The length of the tank is 300 cm = 3 metre.

- 18. Gold is 19.3 times heavier than water. The length of a rectangular gold bar is 7.8 cm, the breadth is 6.4 cm and the height is 2.5 cm. What is the weight of the gold bar?**

**Solution :**

Here, length = 7.8 cm  
 breadth = 6.4 cm  
 height = 2.5 cm

$$\therefore \text{Volume of the gold bar} = (7.8 \times 6.4 \times 2.5) \text{ cc} \\ = 124.8 \text{ cc}$$

Now, the weight of 124.8 cc water = 124.8 gm

Since 1 cc of water = 1 gm

$$\begin{aligned} \text{As gold is 19.3 times heavier than water,} \\ \text{so the weight of 124.8 cc gold} &= 124.8 \times 19.3 \text{ gm} \\ &= 2408.64 \text{ gm} \end{aligned}$$

$\therefore$  Weight of the gold bar is 2408.64 gm.

- 19. The length of a small box is 15 cm 2.4 mm, the breadth is 7 cm 6.2 mm and the height is 5 cm 8 mm. What is the volume of the box in cubic centimetres.**

**Solution :**

Here, length = 15 cm 2.4 mm = 15.24 cm  
 breadth = 7 cm 6.2 mm = 7.62 cm  
 height = 5 cm 8 mm = 5.8 cm

$$\begin{aligned} \therefore \text{The volume of the box} &= \text{Length} \times \text{Breadth} \times \text{Height} \\ &= (15.24 \times 7.62 \times 5.8) \text{ cc} \\ &= 673.547 \text{ cc (Approx)} \end{aligned}$$

$\therefore$  The volume of the box is 6 × 3.457 cc (Aprrox).

- 20. The length of a rectangular reservoir is 5.5 metres, the breadth is 4 metres and the height is 2 metres. If the reservoir is full of water, what is the volume of water in litres and its weight in kg?**

**Solution :**

Here, length = 5.5 m = 550 cm  
 breadth = 4m = 400 cm  
 height = 2 m = 200 cm

$$\begin{aligned} \therefore \text{Volume} &= \text{Length} \times \text{Breadth} \times \text{Height} \\ &= 550 \times 400 \times 200 \text{ cc} \\ &= 44000000 \text{ cc} \end{aligned}$$

We know, 1000 cc = 1 litre

$$\therefore 44000000 \text{ cc} = \frac{44000000}{1000} \\ = 44000 \text{ litre}$$

Again, we know, 1 litre = 1 kg

$$\therefore 44000 \text{ litre} = 44000 \text{ kg}$$

The calculated volume is 44000 litre and weight is 44000 kg weight.

- 21. The length of a rectangular field is 1.5 times its breadth. An amount of Tk. 10,260 is spent to plant grass at Tk. 1.90 per sq. metres. How much money will be spent at Tk. 2.50 per metre to erect a fence around that field?**

**Solution :** Let,

The breadth = x m

$\therefore$  The length = 1.5x m

$$\therefore \text{The area of the field} = \text{Length} \times \text{Breadth}$$

$$= 1.5x \times x \text{ sq. m}$$

$$= 1.5x^2 \text{ sq. m}$$

So, at the rate of 1.90 taka per sq. m,  
the cost of  $1.5x^2$  sq. m = Tk.  $1.90 \times 1.5x^2$   
= Tk.  $2.85x^2$

$\therefore$  According to question,

$$2.85x^2 = 10260$$

$$\text{or, } x^2 = 3600$$

$$\text{or, } x = \sqrt{3600}$$

$$\text{or, } x = 60$$

That is the breadth of the field = 60 m

$$\text{so } " \text{ length } " " = 1.5 \times 60 \text{ m}$$

$$= 90 \text{ m}$$

$$\therefore \text{The perimeter of the field} = 2(\text{Length} + \text{Breadth})$$

$$= 2(90 + 60) \text{ m}$$

$$= 2 \times 150 \text{ m} = 300 \text{ m}$$

Now if Tk. 2.50 is required for fencing 1m,  
Total expense will be  $= 300 \times 2.50 = 750$  taka  
 $\therefore$  Tk. 750 will be spent

22. An amount of Tk. 7,200 is spent to cover the floor of a room by carpet. An amount of Tk. 576 would be saved if the breadth were 3 metres less. What is the breadth of the room?

**Solution :** If breadth were 3 meter less, Tk. 576 would be saved

For 3 m breadth, cost is 576 taka

$$\therefore 1 " " " \frac{576}{3} = 192 \text{ taka}$$

Cost is 192 taka when breadth is 1 m

$$\therefore " " 1 " " " " \frac{1}{192} "$$

$$\therefore " " 7200 " " " " \frac{1 \times 7200}{192}$$

$$= 37.5 \text{ m}$$

$\therefore$  Breadth of the house is 37.5 m.

23. Around inside a rectangular garden of length 80 metres and breadth 60 metres, there is a road of breadth 4 metres. How much money will be spent to construct that road at Tk. 7.25 per square metre?

**Solution :**

Here, the length of the garden = 80 m

the breadth " " " = 60 m

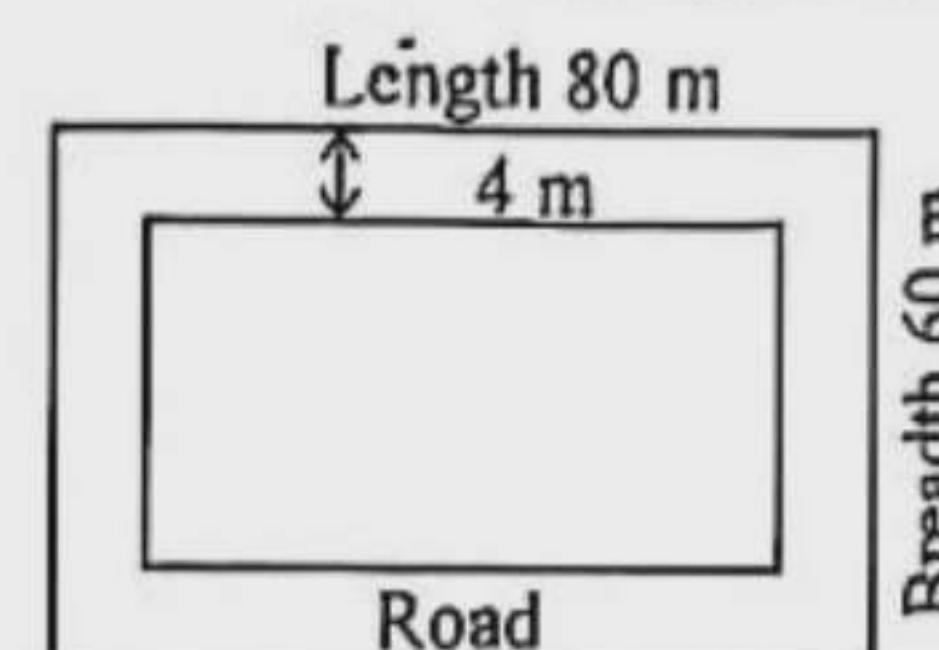
$\therefore$  Its area = Length  $\times$  Breadth

$$= 80 \times 60 \text{ sq. m}$$

$$= 4800 \text{ sq. m}$$

The length of the garden excluding road =  $(80 - 2 \times 4)$  m  
= 72 m

The breadth of the garden excluding road  
=  $(60 - 2 \times 4)$  m  
= 52 m



$\therefore$  The area of the garden excluding road

$$= 72 \times 52 \text{ sq. m}$$

$$= 3744 \text{ sq.m}$$

So, the area of the road =  $(4800 - 3744)$  sq.m  
= 1056 sq. m

Here, cost per sq. m = Tk. 7.25

$$\therefore \text{Cost for 1056 sq. m} = \text{Tk. } 1056 \times 7.25$$

$$= \text{Tk. } 7656$$

$\therefore$  Tk. 7656 would be spent

24. A square open reservoir of depth 2.5 metres contains 28,900 litres of water inside. How much money will be spent to put a lead sheet in the insideside at Tk. 12.50 per sq. metres?

**Solution :**

We know, 1 litre = 1000 cc

$$\therefore 28,900 \text{ litre} = 28,900 \times 1000 \text{ cc}$$

$$= 28900000 \text{ cc}$$

$$= 28.90 \text{ cu.m.}$$

$$\text{So, the area of the square base} = \frac{\text{Volume}}{\text{Height}}$$

$$= \frac{28.90}{2.50} \text{ sq. m}$$

$$= 11.56 \text{ sq. m}$$

$$\text{The length of the base} = \sqrt{11.56}$$

$$= 3.4 \text{ m}$$

$$\therefore \text{The area of one adjacent sides of the base}$$

$$= (3.4 \times 2.5) \text{ sq. m}$$

$$= 8.5 \text{ sq. m}$$

$$\therefore \text{The area of the 4 adjacent sides of the base}$$

$$= (4 \times 8.5) \text{ sq. m}$$

$$= 34 \text{ sq. m}$$

$$\text{So, total area} = (\text{area of the base} + \text{area of 4 adjacent faces of the base})$$

$$= (11.56 + 34) \text{ sq. m}$$

$$= 45.56 \text{ sq. m}$$

We have, cost per square metre = 12.50 taka

$$\therefore \text{Total cost for } 45.56 \text{ sq. m} = 12.50 \times 45.56 \text{ taka}$$

$$= 569.5 \text{ taka}$$

$\therefore$  Total cost is 569.5 taka.

25. The length of the floor of a house is 26 metres and breadth is 20 metres. How many mats of length 4 metres and breadth 2.5 metres will be required to cover the floor completely? How much money will be spent if the price of each mat is Tk. 27.50?

**Solution :**

Here, for the house :

Length = 26 m and breadth = 20 m

$$\therefore \text{Its area} = \text{Length} \times \text{Breadth}$$

$$= 26 \times 20 \text{ sq. m}$$

$$= 520 \text{ sq.m}$$

Again, for the mat :

Length = 4 m and breadth = 2.5 m

$$\therefore \text{Its area} = \text{Length} \times \text{Breadth}$$

$$= 4 \times 2.5 \text{ sq. m}$$

$$= 10 \text{ sq. m}$$

$$\therefore \text{Required number of mats} = \frac{520 \text{ sq. m}}{10 \text{ sq. m}}$$

$$= 52$$

Here, the cost of 1 mat = Tk. 27.50

$$\therefore \text{Total cost for 52 mats} = \text{Tk. } 27.50 \times 52$$

$$= \text{Tk. } 1430$$

$\therefore$  Total mat 52 pcs. and total expenses Tk. 1430.

26. The length of a book is 25 cm and the breadth is 18 cm. The number of pages of the book is 200 and the thickness of each page is 0.1 mm. Find the volume of the book.

Solution :

200 pages = 100 sheet [ $\because 2$  pages = 1 sheet]

Thickness of 1 sheet = 0.1 mm

$$\therefore " " 100 " = (100 \times 0.1) " = 10 \text{ mm}$$

$$= 1 \text{ cm} [\because 10 \text{ mm} = 1 \text{ cm}]$$

$$\therefore \text{Volume} = \text{Length} \times \text{Breadth} \times \text{Thickness}$$

$$= (25 \times 18 \times 1) \text{ cu. cm}$$

$$= 450 \text{ cu. cm}$$

$\therefore$  Volume of the book 450 cu. cm.

27. The length of a pond is 32 metres, breadth is 20 metres and the depth of water of the pond is 3 metres. The pond is being made empty by a water pump which can remove 0.1 cubic metres of water per second. How much time will be required to make the pond empty?

Solution :

Here, length of the pond = 32 m

breadth of the pond = 20 m

depth of the pond = 3 m

$$\therefore \text{Volume} = \text{Length} \times \text{Breadth} \times \text{Depth}$$

$$= 32 \times 20 \times 3 \text{ m}^3$$

$$= 1920 \text{ m}^3$$

Now, 0.1 m<sup>3</sup> water is pumped in 1 sec.

$$1 \text{ m}^3 \quad " \quad " \quad " \quad " \quad \frac{1}{0.1} "$$

$$1920 \text{ m}^3 \quad " \quad " \quad " \quad " \quad \frac{1920}{0.1} "$$

$$= 19200 \text{ sec}$$

$$= 5 \text{ hours } 20 \text{ min}$$

$$(\text{Approx.})$$

Ans. 5 hours 20 min.

28. A solid cube of sides 50 cm is kept in an empty reservoir of length 3 metres, breadth 2 metres and height 1 metre. The cube is taken out after filling the reservoir with water. What is the depth of water now?

Solution :

For the reservoir : Length = 3 m

Breadth = 2 m

Height = 1 m

$$\therefore \text{Volume of the reservoir} = \text{Length} \times \text{Breadth} \times \text{Height}$$

$$= 3 \times 2 \times 1 \text{ m}^3$$

$$= 6 \text{ m}^3$$

For solid metal cube :

$$\text{Length of one side of the cube} = 50 \text{ cm}$$

$$= 0.50 \text{ m}$$

$$\therefore \text{Its volume} = 0.5 \times 0.5 \times 0.5 \text{ m}^3$$

$$= 0.125 \text{ m}^3$$

$$\therefore \text{Inside volume of the reservoir excluding the solid cube} = (6 - 0.125) \text{ m}^3 = 5.875 \text{ m}^3$$

$$\text{Again, area of the base of the reservoir} = (3 \times 2) \text{ sq.m.}$$

$$= 6 \text{ sq.m}$$

$$\therefore \text{Depth of water of the reservoir after removal of the solid metal cube} = (5.875 \div 6) \text{ m}$$

$$= 0.98 \text{ m (approx)}$$

$$= 98 \text{ cm (approx)}$$

$\therefore$  The depth of water is 98 cm (Approx.)

### Creative Questions with Solutions

**Ques. 29** The breadth of a room is  $\frac{2}{3}$  times of its length. The length and height of the room are 15 m and 4 m respectively. The floor of the room is set with stone of the size 50 sq. cm leaving 1 m margin in all sides. Air is 0.00129 times heavier than water.

- Find out the perimeter of the room. 2
- How many pieces of stone will be needed to cover that floor? 4
- How much air is there in the room? 4

**Solution to Question No. 29 :**

a Given that,  
length of the house = 15 m

$$\therefore \text{Breadth of the house} = \frac{2}{3} \times \text{Length}$$

$$= \frac{2}{3} \times 15 \text{ m}$$

$$= 10 \text{ m}$$

$$\text{We know, perimeter} = 2(\text{length} + \text{breadth})$$

$$= 2(15 + 10) \text{ m}$$

$$= 50 \text{ m}$$

So, the required perimeter is 50m.

b Length of the house excluding margin  
= 15 m - (1 + 1) m  
= 13 m

$$\text{Breadth of the room excluding margin}$$

$$= 10 \text{ m} - (1 + 1) \text{ m} = 8 \text{ m}$$

c Area of the floor excluding margin  
= (13 × 8) sq. m  
= 104 sq. m

$$\text{Length of one side of square stone}$$

$$= 50 \text{ cm} = 0.5 \text{ m}$$

$$\therefore \text{Area of each square stone} = (0.5 \times 0.5) \text{ sq. m}$$

$$= 0.25 \text{ sq. m}$$

$$\therefore \text{Total stone needed} = \frac{104}{0.25} = 416$$

$\therefore$  So, 416 stones will be required.

**c** Given that,

$$\text{Air is heavier than water by } 0.00129 = \frac{129}{100000} \text{ times}$$

$$\begin{aligned}\text{The volume of the house} &= \text{Length} \times \text{Breadth} \times \text{Height} \\ &= 15\text{m} \times 10\text{m} \times 4\text{m} \\ &= 1500\text{ cm} \times 1000\text{ cm} \times 400\text{ cm} \\ &= 600000000\text{ cu cm.}\end{aligned}$$

$$\begin{aligned}\text{Again, air is } 0.00129 \text{ times heavier than water.} \\ \therefore \text{weight of } 600000000 \text{ cu. cm of air} &= 600000000 \times 0.00129 \text{ gm} \\ &= 600000000 \times \frac{129}{100000} \text{ gm} \\ &= 774000 \text{ gm.} \\ &= 774 \text{ kg.}\end{aligned}$$

So, there is 774 kg of air in the house.

**Ques. 30** The length of a rectangular plot of land is 80 m. Its breadth is 60 m. In the middle of the land a tank with 3 m depth is dug keeping 4 m wide bank. 0.1 cubic meter water is emptied by a machine.

- Express the depth of the tank in inches. 2
- Find out the area of the bank of the tank. 4
- How much time is required to empty the tank? 4

**Solution to Question No. 30 :**

**a** Here the depth of the pond is 3m.

We know, 1m = 39.37 inches

$$\begin{aligned}\therefore 3\text{m} &= 39.37 \times 3 \\ &= 118.11 \text{ inches}\end{aligned}$$

So, the depth of the pond is 118.11 inches.

**b** Length of rectangular land = 80 m

and breadth = 60 m

$$\begin{aligned}\therefore \text{Area of the rectangular land} &= \text{Length} \times \text{Breadth} \\ &= (80 \times 60) \text{ sq. m} \\ &= 4800 \text{ sq. m}\end{aligned}$$

$$\begin{aligned}\text{Length of pond excluding bank} &= 80 - (4 + 4) \text{ m} \\ &= 72 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Width of pond excluding bank} &= 60 - (4 + 4) \text{ m} \\ &= 52 \text{ m}\end{aligned}$$

$$\begin{aligned}\therefore \text{Area of pond excluding bank} &= (72 \times 52) \text{ sq. m} \\ &= 3744 \text{ sq. m}\end{aligned}$$

$$\begin{aligned}\therefore \text{Area of bank} &= (4800 - 3744) \text{ sq. m} \\ &= 1056 \text{ sq. m}\end{aligned}$$

$$\therefore \text{Area of bank } 1056 \text{ sq. m.}$$

**c** The volume of the pond = Length × Breadth × Depth

Given,

Depth of pond = 3 m

From 'b', length of pond = 72 m

Breadth of pond = 52 m

Again,

it takes time to remove 0.1 cu m = 1 sec

$$\therefore " " " " " 1 " " " = \frac{1 \text{ sec}}{0.1}$$

$$\begin{aligned}" " " " " " 11,232 " " &= \frac{1 \text{ sec} \times 11232}{0.1} \\ &= 11,232 \times 10 \text{ sec} \\ &= \frac{112320}{60 \times 60} \text{ hours} \\ &= 31.2 \text{ hours} \\ &= 31 \text{ hours } 12 \text{ minute}\end{aligned}$$

So, the required time to remove the water of the pond is 31 hours 12 minutes.

**Ques. 31** The area of a rectangular school campus is 10 acres. Its length is four times the breadth. The size of the auditorium is 40 m × 35 m × 10 m and the thickness of the wall is 15 cm.

- What is the area of the campus in hectare? 2
- Find out the length of the boundary wall in metre. 4
- Find out the volume of the 4 walls of the auditorium. 4

**Solution to Question No. 31 :**

**a** We know, 2.47 acres = 1 hectare

$$\therefore 1 \text{ acres} = \frac{1}{2.47} \text{ hectare}$$

$$\begin{aligned}\therefore 10 \text{ acres} &= \frac{1 \times 10}{2.47} \text{ hectare} \\ &= 4.04852996 \text{ hectare} \\ &= 4.05 \text{ hectare (Approx)}$$

**b** We know,

$$\begin{aligned}1 \text{ acre} &= 4046.24 \text{ sq. m} \\ \therefore 10 \text{ acres} &= 4046.24 \times 10 \text{ sq. m} \\ &= 40462.4 \text{ sq. m}\end{aligned}$$

So, the area of the school campus is 40462.4 sq. m ....(i)

Let, the breadth of the campus be x m.

So, the length of the campus is 4x m.

$$\begin{aligned}\therefore \text{Area of the campus} &= (4x \times x) \text{ sq. m} \\ &= 4x^2 \text{ sq. m} .....(ii)\end{aligned}$$

Now from (i) and (ii), we can write,

$$4x^2 = 40462.4$$

$$\text{or, } x^2 = 10115.6$$

$$\text{or, } x = \sqrt{10115.6}$$

$$\therefore x = 100.58$$

So, the breadth of the campus is 100.58 m.

∴ Length of the campus is  $(100.58 \times 4) m = 402.31 m.$

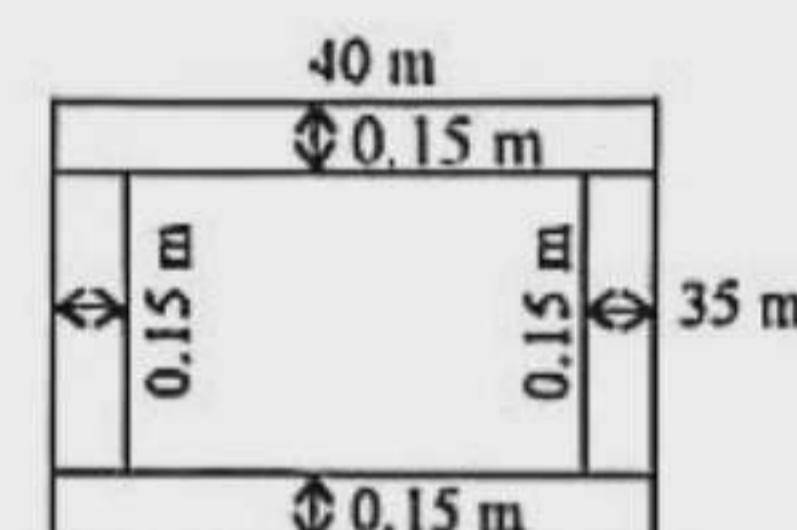
**c** Length of the auditorium is 40 m, breadth 35 m and height 10 m.

Thickness of wall

$$= 15 \text{ m}$$

$$= \frac{15}{100} \text{ m}$$

$$= 0.15 \text{ m}$$



Volume of two walls along length

$$= (40 \times 0.15 \times 10 \times 2) \text{ cu. m} = 120 \text{ cu. m}$$

Volume of 2 wall along breadth

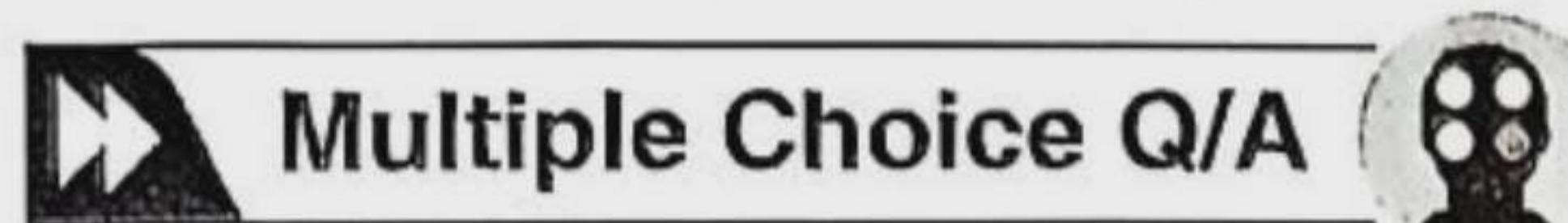
$$= \{35 - (0.15 \times 2)\} \times 0.15 \times 10 \times 2 \text{ cu. m}$$

$$= (35 - 0.3) \times 0.15 \times 10 \times 2 \text{ cu. m}$$

$$= 34.7 \times 0.15 \times 10 \times 2 \text{ cu. m} = 104.1 \text{ cu. m}$$

$$\begin{aligned}\therefore \text{Volume of four walls} &= (120 + 104.1) \text{ cu. m} \\ &= 224.1 \text{ cu. m}\end{aligned}$$

∴ Volume of four walls of the auditorium is 224.1 cu. m.



Designed as per topic



### 3.1 Concept of Measurement and Units

► Textbook Page 29

1. Which one gives us the idea of measurement? (Easy)
  - (A) Multiplication
  - (B) Fraction
  - (C) Subtraction
  - (D) Unit
2. What is the unit measurement for length? (Easy)
  - (A) .1 unit
  - (B) 1 unit
  - (C) 10 unit
  - (D) 1000 unit

### 3.2 Measurement in Metric System

► Textbook Page 29

3. In metric system, what is the unit of measurement of length? (Easy)
  - (A) Km
  - (B) Metre
  - (C) Milimetre
  - (D) Centimetre
4. In Greek language hepto means— (Easy) [DB '19]
  - (A) 10 times
  - (B) 100 times
  - (C) 1,000 times
  - (D) 10,000 times
5. What is the meaning of 'Deci' in Greek language? (Easy) [CtgB '19]
  - (A) hundredth
  - (B) tenth
  - (C) 10 times
  - (D) 100 times
6. What is the meaning of 'Hecto' in Greek language? (Easy) [DjB '18]
  - (A) 10 times
  - (B) 100 times
  - (C)  $\frac{1}{10}$  times
  - (D)  $\frac{1}{100}$  times
7. In which country the Metric system is used first? (Easy) [DjB '17]
  - (A) Greek
  - (B) England
  - (C) Japan
  - (D) France
8. What do you mean by 'Deca' in Greek language? (Easy) [DjB '17]
  - (A) 10 times
  - (B) 100 times
  - (C) one tenth
  - (D) one hundredth
9. The word 'One Tenth' comes from which language? (Easy) [CtgB '16]
  - (A) Greek
  - (B) Latin
  - (C) Bangla
  - (D) English
10. In Greek, Deca means—. (Easy)
 

[Rajuk Uttara Model College, Dhaka]

  - (A) 10 times
  - (B) 100 times
  - (C) Tenth
  - (D) hundredth
11. In Greek language—. (Hard) [CtgB '17]
  - i. deca means 10 times
  - ii. hecto means 100 times
  - iii. killo means 1000 times

Which one is correct?

  - (A) i & ii
  - (B) ii & iii
  - (C) i & iii
  - (D) i, ii & iii
12. In metric system 1 kilometre equal—. (Hard) [SB '16]
  - i. 10 hectometre
  - ii. 100 decametre
  - iii. 1000 metre

Which one is correct?

  - (A) i & ii
  - (B) i & iii
  - (C) ii & iii
  - (D) i, ii & iii



### 3.3 The units of measuring length

► Textbook Page 31

13. 1 km = how many metre? (Easy)
  - (A) 1000 m
  - (B) 100 m
  - (C) 10 m
  - (D) 10000 m
14. How many inches is equal to 1 metre? (Easy)
  - (A) 32.37 in
  - (B) 35.37 in
  - (C) 37.37 in
  - (D) 39.37 in
15. How many miles is equal to 1 km. (Easy)
  - (A) 0.60 miles
  - (B) 0.62 miles
  - (C) 0.61 miles
  - (D) 0.72 miles
16. 100000 metre = how many kilometre? (Medium)
  - (A) 10
  - (B) 100
  - (C) 1000
  - (D) 10000
17. 10 km = what mile? (Medium)
  - (A) 0.621 mile (approximate)
  - (B) 6.211 mile (approximate)
  - (C) 16.10 mile (approximate)
  - (D) 62.11 mile (approximate)
18. If the breadth of a rectangular room  $\frac{1}{3}$  time of length and perimeter is 48m which one is the breadth? (Medium) [RB '19]
  - (A) 6m
  - (B) 12m
  - (C) 18m
  - (D) 24m
19. The length of a rectangular garden is one and half times its breadth. If breadth is 16 metres, what is its perimeter? (Medium) [JB '19]
  - (A) 40 m
  - (B) 64 m
  - (C) 80 m
  - (D) 96 m
20. How many feet long is the tap which is used to measure a large length? (Easy) [CtgB '17]
  - (A) 30
  - (B) 10
  - (C) 300
  - (D) 100
21. The length of a rectangle is 330 yards, its breadth is  $\frac{1}{3}$  times of length. What is the breadth of the rectangle in metres? (Medium) [JB '16]
  - (A) 110.000
  - (B) 110.584
  - (C) 140.584
  - (D) 440.584
22. The perimeter of a wheel of a bicycle is 3.5 meters. How many times will the wheel revolve to cover a distance of 7 kilometres? (Hard) [CB '16]
  - (A) 20,000
  - (B) 2,000
  - (C) 200
  - (D) 2
23. How longer is nautical mile than mile in feet? (Easy) [CtgB '16]
  - (A) 800
  - (B) 4320
  - (C) 5280
  - (D) 6080
24. One nautical mile = ? (Easy) [SB '16]
  - (A) 4080 feet
  - (B) 5080 feet
  - (C) 6070 feet
  - (D) 6080 feet
25. How many feet long tape is used to measure a large length? (Easy) [Rajuk Uttara Model College, Dhaka]
  - (A) 30
  - (B) 10
  - (C) 300
  - (D) 100
26. 1 inch = how many cm? (Easy)
  - (A) 2 cm
  - (B) 14 cm
  - (C) 2.44 cm
  - (D) 2.54 cm

### 3.4 Relation between British and Metric System

► Textbook Page 31

27. How many mile is equal to one kilometre? (Easy) [CB '19]  
 ④ 62 mile      ⑤ 61.1 mile  
 ② 1.61 mile      ⑥ 0.62 mile
28. 1 acre = ? (Easy) [CtgB '19]  
 ③ 4046.86 sq m      ④ 4064.86 sq m  
 ① 4406.86 sq m      ⑤ 4640.86 sq m
29. How many square centimetres are there in 2 square inches? (Medium) [SB '19]  
 ④ 0.16 sq centimetres      ⑤ 0.32 sq centimetres  
 ② 6.45 sq centimetres      ⑥ 12.90 sq centimetres
30. Which one of the following is equal to 10 hectares? (Medium) [BB '19]  
 ④ 2.47 acres      ⑤ 24.7 acres  
 ② 247 acres      ⑥ 2470 acres
31. 2 miles = how many yards? (Medium) [RB '18]  
 ④ 6080 yards      ⑤ 5280 yards  
 ② 3520 yards      ⑥ 1760 yards
32. 1 mile = What? (Easy) [DjB '18]  
 ④ 0.61 km      ⑤ 0.62 km  
 ② 1.61 km      ⑥ 1.62 km
33. 1 mile = how many km? (Easy) [DB '16]  
 ④ 0.62      ⑤ 1.16      ⑥ 1.26      ⑦ 1.61
34. 1 mile equal —. (Hard) [RB '16]  
 i. 1.61 kilometre      ii. 0.62 kilometre  
 iii. 1610 metre  
 Which one is correct?  
 ④ i & ii      ⑤ ii & iii      ⑥ i & iii      ⑦ i, ii & iii
35. How many kilometres is equal to one mile? (Easy) [DjB '16; JB '15]  
 ④ 1.61      ⑤ 1.16      ⑥ 1.06      ⑦ 0.62
36. 1 inch = what cm? (Easy)  
 [Viqarunnisa Noon School and College, Dhaka]  
 ④ 2.45 cm      ⑤ 2.64 cm  
 ② 2.46 cm      ⑥ 2.54 cm
37. Relation between units of different systems of measurement —. (Hard) [JB '17]  
 i. 1 acre = 4840 sq. metre  
 ii. 1 inch = 2.54 cm      iii. 1 km = 0.62 miles  
 Which one is correct?  
 ④ i & ii      ⑤ i & iii      ⑥ ii & iii      ⑦ i, ii & iii
38. Observe the following information —. (Hard) [DjB '17]  
 i. 1 inch = 2.54 cm (app)  
 ii. 1 cubic feet = 28.67 litre (app)  
 iii. 1 cubic metre = 10 staylor (app)  
 Which one is correct?  
 ④ i & ii      ⑤ i & iii      ⑥ ii & iii      ⑦ i, ii & iii
39. 1 staylor is equal to —. (Hard)  
 [Ideal School & College, Dhaka]  
 i. 13.08 cubic yards  
 ii. 1 m<sup>3</sup>  
 iii. 35.3 cubic feet  
 Which one is correct?  
 ④ i & ii      ⑤ i & iii      ⑥ ii & iii      ⑦ i, ii & iii

- 3.5 & 3.6 Measurement of Weight & Measurement of Volume of Liquids ► Textbook Page 32 & 33
40. How is a solid substance measured? (Easy)  
 ④ By volume      ⑤ By weight  
 ② By assumption      ⑥ None of the above
41. The weight of 1 litre of water is equal to how many kgs? (Easy)  
 ④ 1 kg      ⑤ 1.5 kg      ⑥ 2 kg      ⑦ 5 kg
42. 1000 cubic centimetre = how many litre? (Easy)  
 ④ 5      ⑤ 3      ⑥ 2      ⑦ 1
43. Which one of the following is equal to 20 milligram? (Medium) [CtgB '18]  
 ④ 2 centigram      ⑤ 2 decagram  
 ② 2 decigram      ⑥ 2 hectogram
44. Gold is 19.3 times heavier than water. The weight of 1 cubic centimeter water is 1 gram. What is the weight of 10 cubic centimeter gold in gm. (Medium) [JB '16]  
 ④ 1      ⑤ 1.93      ⑥ 19.3      ⑦ 193
45. The volume of a jug is 4.5 litre. How many jugs of water will be there in 900 litre? (Medium)  
 ④ 100      ⑤ 300      ⑥ 200      ⑦ 400
46. At 4°C temperature the weight of 1cc pure water is —. (Easy) [BB '18]  
 ④ 1 gm      ⑤ 100 gm      ⑥ 1000 gm      ⑦ 10000 gm
47. What is the weight of 8000 litre pure water? (Medium) [BB '17]  
 ④ 1 kg      ⑤ 8 kgs  
 ② 8000 kgs      ⑥ 8000 gm
48. 1 cubic feet = how many litres (app.) (Medium)  
 [Ideal School & College, Dhaka]  
 ④ 13.08 litres      ⑤ 28.67 litres  
 ② 35.3 litres      ⑥ 4048 litres
- 3.7 Measurement of Area ► Textbook Page 34
49. How many kathas are there in 5 bighas? (Easy) [DB '19]  
 ④ 20      ⑤ 25      ⑥ 50      ⑦ 100
50. The base of triangular region is 24m and height is 12m. What is the area of region? (Medium) [RB '19]  
 ④ 72m<sup>2</sup>      ⑤ 144m<sup>2</sup>      ⑥ 288m<sup>2</sup>      ⑦ 576m<sup>2</sup>
51. The area of a triangular land is 225 sq metres. If the height is 25 metres, which one is the base? (Medium) [JB '19]  
 ④ 9 m      ⑤ 18 m      ⑥ 25 m      ⑦ 36 m
52. If the area of the triangle is 150 sq m height is 10 cm, then what is the length of base? (Medium) [CtgB '19]  
 ④ 75 cm      ⑤ 65 cm      ⑥ 30 cm      ⑦ 15 cm
53. What is the length of the diagonal of a square with side 2 metre? (Medium) [CtgB '19]  
 ④  $\sqrt{2}$  m      ⑤  $2\sqrt{2}$  m      ⑥ 4 m      ⑦ 8 m
54. 2 Bigha = ? (Easy) [MB '19]  
 ④ 1600sq yards      ⑤ 1337.8 sq metres  
 ② 3200 sq yards      ⑥ 2672.8 sq metres



- Mathematics**
55. The area of the square garden is 1600 sq metres. What is the length of the diagonal? (Medium) [MB '19]
- (A) 40 metres (B)  $40\sqrt{2}$  metres  
 (B) 80 metres (C)  $80\sqrt{2}$  metres
56. The perimeter of a square field is 8 yards. What is the area of the field in square feet? (Medium) [DB '18]
- (C) 12 (D) 24 (E) 36 (F) 64
57. Area of a rectangular garden is 300 sq m and its breadth is 15 m. What is the perimeter of the garden? (Medium) [JB '18]
- (C) 10 m (D) 35 m (E) 70 m (F) 300 m
58. If the area of a rectangular garden is 714 sq m and its length is 34 metre. What is the perimeter of the garden? (Medium) [SB '18]
- (A) 55 metre (B) 84 metre  
 (C) 110 metre (D) 136 metre
59. 10 decimal =— sq feet? (Medium) [SB '18]
- (A) 4346 sq feet (B) 4347 sq feet  
 (C) 4356 sq feet (D) 4365 sq feet
60. The area of a rectangular garden is 400 sq. metre and length is 25 metre, then what is its perimetre? (Medium) [SB '17]
- (C) 25 m (D) 41 m (E) 82 m (F) 100 m
61. The lengths, width and height of a rectangular cube are 6, 5 and 4 cm. respectively. What is the area of the total surface in sq. cm? (Hard) [BB '17]
- (A) 148 (B) 120 (C) 74 (D) 15
62. If the base 1.5 m hight 80 cm then how much area in sq. metre of triangle? (Medium) [JB '17]
- (A) 0.6 (B) 1.2 (C) 60 (D) 120
63. Which one of the following is the perimeter of a square? (Easy) [DB '16]
- (A) 4 × one side (B) 4 × one diagonal  
 (A) 3 × one side (D) 2(length + breadth)
64. How many square metres are there in 1 square yard? (Easy) [JB '16]
- (A) 0.24(Approx.) (B) 0.54(Approx.)  
 (C) 0.64(Approx.) (D) 0.84(Approx.)
65. 2 Bigha = How many square yards? (Easy) [CB '16]
- (A) 720 (B) 1440 (C) 1600 (D) 3200
66. Length of a rectangle is 330 yards. It's breadth is one-third of length. What is the breadth of rectangle in metre? (Medium) [Rajuk Uttara Model College, Dhaka]
- (A) 100.584 (B) 110.584  
 (A) 140.584 (D) 440.584
67. Width of a rectangular field is 16 m and it's perimeter is 82 m. What is the diagonal of the garden? (Medium) [Rajuk Uttara Model College, Dhaka]
- (A) 29.68 m (B) 32.68 m  
 (A) 28.96 m (D) 41 m
68. What is the area of a cubic having the sides 4 cm each? (Hard) [Ideal School & College, Dhaka]
- (A) 16 sq. cm (B) 24 sq. cm  
 (C) 64 sq. cm (D) 96 sq. cm
69. The area of a triangular land is 264 sq. m. What is the height of the base is 22m? (Medium) [Ideal School & College, Dhaka]
- (C) 18m (D) 20m (E) 24m (F) 30m
70. In 24 rounds a runner runs 9 km 600 m in a circular track. What is the length of the track? (Medium) [Vigarnnisa Noon School and College, Dhaka]
- (C) 200 m (D) 300 m (E) 400 m (F) 500 m
71. If the length of the side of a square is 5 cm, then its— (Hard) [JB '19]
- i. Area = 25 sq cm  
 ii. length of a diagonal =  $5\sqrt{2}$  cm  
 iii. Perimetre = 10 cm
- Which one is correct?
- (A) i & ii (B) i & iii (C) ii & iii (D) i, ii & iii
72. If the length of a rectangle is 12 metres and its breadth is 5 metres then its—. (Hard) [DB '18]
- i. perimeter is 34 metres  
 ii. area is 60 sq metres  
 iii. one of the diagonal is 13 metres
- Which one of the following is correct?
- (A) i & ii (B) i & iii (C) ii & iii (D) i, ii & iii
73. In case of measurement and units—. (Hard) [CB '18]
- i. 1 square yard = 9 square feet  
 ii. 1 inch = 2.54 cm  
 iii. 1 katha = 72 square yard
- Which one of the following is correct?
- (A) i & ii (B) i & iii (C) ii & iii (D) i, ii & iii
74. 1 katha equal—. (Hard) [DB '17]
- i. 720 sq. feet ii. 80 sq. yard  
 iii. 67.89 sq. metres (Approx.).
- Which one is correct?
- (A) i & ii (B) i & iii (C) ii & iii (D) i, ii & iii
75. The length of a rectangular region is 12 metres and the breadth is 5 metres. Then its—. (Hard) [DjB '16]
- i. Perimeter 34 metres  
 ii. Area 60 square metre  
 iii. The length of a diagonal is 13 metres
- Which one is correct?
- (A) i & ii (B) i & iii (C) ii & iii (D) i, ii & iii
76. The length of the adjacent sides of a rectangle are 4 cm and 3 cm. (Hard) [Ideal School & College, Dhaka]
- i. Half of the perimetre is 7 cm  
 ii. The length of the diagonal is 5 cm  
 iii. The area is 12 sq. cm
- Which one is correct?
- (A) i & ii (B) i & iii (C) ii & iii (D) i, ii & iii
- Answer to the questions no. 77 and 78 based on the following information :
- The length of a rectangular park is 40 metres and its breadth is 30 metres. There is a 2.5 metres wide road around outside. [SB '19]
77. What is the area of the park? (Easy)
- (B) 1200 are (D) 12 are (C) 1.2 are (F) 0.12 are

78. What is the area of the road? (Medium)  
 (a) 325 sq m (b) 375 sq m  
 (c) 875 sq m (d) 1575 sq m
- Answer to the questions no. 79 and 80 with the help of the given information :  
 The area of square garden is 225 sq metre.  
 [BB '19]
79. What is the perimeter of the garden? (Medium)  
 (a) 15 metres (b) 30 metres  
 (c) 45 metres (d) 60 metres
80. What is the diagonal of the garden? (Medium)  
 (a) 21.21 metres (b) 25.98 metres  
 (c) 30 metres (d) 45 metres
- Answer to the questions number 81 and 82 by using the following information :  
 The length and width of a rectangular garden are 40 metres and 30 metres respectively. There is a road with 3 metres wide inside around the garden.  
 [CB '18]
81. What is the perimeter of the garden? (Medium)  
 (a) 70 metres (b) 76 metres  
 (c) 116 metres (d) 140 metres
82. What is the area of the road? (Medium)  
 (a) 456 sq m (b) 384 sq m  
 (c) 219 sq m (d) 201 sq m
- Answer the questions no. 83 and 84 with the help of the given information :  
 The length of a rectangular field is 50 metres and its breadth is 20 metres. Around outside, there is a road of breadth 3 metres. [CtgB '18]
83. What is the area of the field? (Easy)  
 (a) 140 sq metres (b) 1000 sq metres  
 (c) 2000 sq metres (d) 3000 sq metres
84. What is the area of the road? (Medium)  
 (a) 456 sq metres (b) 384 sq metres  
 (c) 219 sq metres (d) 201 sq metres
- Answer to the questions no. 85 and 86 based on the following information :  
 The length of your drawing note book is 40 cm, breadth is 30 cm and around it there is 2 cm width margin.  
 [BB '18]
85. What is the area of the note book? (Easy)  
 (a) 600 sq cm (b) 700 sq cm  
 (c) 1200 sq cm (d) 1600 sq cm
86. What is the area of the margin? (Medium)  
 (a) 144 sq cm (b) 208 sq cm  
 (c) 228 sq cm (d) 264 sq cm
- Answer to the questions no. 87 and 88 in the light of the following information :  
 The length and width of a rectangular garden are 30 metres and 20 metres respectively. There is a road with 3 metres wide inside around the garden.  
 [BB '17]
87. What is the area of the garden in sq. metre? (Easy)  
 (a) 600 (b) 100 (c) 80 (d) 60
88. What is the area of the road in sq. metre? (Medium)  
 (a) 336 (b) 264 (c) 159 (d) 141

- Answer to the questions no. 89 and 90 on the basis of the following figure :
- 
- In the figure,  $AD \parallel BC$  and  $AD = BE$  [BB '17]
89. What is the area of the  $\triangle DEC$  in sq. metre? (Easy)  
 (a) 30 (b) 60 (c) 120 (d) 240
90. What is the area of the region ABCD in sq. metre? (Medium)  
 (a) 60 (b) 100 (c) 180 (d) 360
- 
- Answer to the question numbers 91 and 92 using the above information : [RB '16]
91. What is the length of the given rectangular region? (Easy)  
 (a) 12 metres (b) 36 metres  
 (c) 48 metres (d) 144 metres
92. What is the perimeter of the given rectangular region? (Medium)  
 (a) 12 metres (b) 36 metres  
 (c) 48 metres (d) 96 metres
- Answer the questions no. 93 & 94 according to the following information :  
 Length of the floor of a rectangular room is 5 metres more than its breadth and perimeter of the floor is 70 metres. [CB '16]
93. What is the breadth of the floor of the room in metres? (Medium)  
 (a) 15 (b) 20 (c) 30 (d) 35
94. What is the area of the floor of the room in sq. metre? (Medium)  
 (a) 150 (b) 300 (c) 350 (d) 500
- 3.8 Volume ➔ Textbook Page 37
95. How is liquid substance measured? (Easy)  
 (a) By volume (b) By weight  
 (c) By assumption (d) None of the above
96. The edge of cubic reservoir is 4m. What is the volume of reservoir? (Medium) [RB '19]  
 (a)  $12\text{m}^3$  (b)  $16\text{m}^3$  (c)  $64\text{m}^3$  (d)  $96\text{m}^3$
97. What is the volume of a cube having the sides 3cm each? (Medium) [CB '19]  
 (a) 27cc (b) 18cc (c) 9cc (d) 6cc
98. If the length of a reservoir is 3 metres, the breadth is 2 metres and height is 1 metres. How many litres of water are there in the reservoir? (Hard) [CB '19]  
 (a) 6 litres (b) 60 litres  
 (c) 600 litres (d) 6000 litres



99. If the length of a box is 4m, width is 3m 20cm and height is 2m 50cm. What is the volume of the box? (Medium) [MB '19]  
 @ 320,000 cubic cm   @ 32,00,000 cubic cm  
**C** @ 320,00,000 cubic cm   @ 320,000,000 cubic cm
100. What is the volume of a box with the length 3 metres, breadth 2 metres and height 1 metre 50 centimetre? (Medium) [RB '18]  
 @ 6 cubic metres   @ 6.5 cubic metres  
**D** @ 7.5 cubic metres   @ 9 cubic metres
101. The length of a side of a cubical tank is 5 metre. Which is the volume of the tank? (Medium) [CB '18]  
 @ 125 cubic metres   @ 25 cubic metres  
**A** @ 20 cubic metres   @ 15 cubic metres
102. The length of a house is 3m, breadth is 2m, and height is 1m. Air is 0.00129 times heavier than water. How many grams of air are there in the house? (Hard) [DJB '18]  
 @ 0.774 gm   @ 7.74 gm  
**C** @ 77.4 gm   @ 7740 gm
103. The length of a reservoir is 3 metres, breadth is 2 metres and height is 1 metre. How much water in litres will it contain? (Hard) [DB '17]  
**C** @ 60   @ 600   @ 3000   @ 6000
104. If length 25 cm breadth 16 cm and height 0.3 mm of a paper, then how much volume in cubic cm of such 10 papers. (Medium) [JB '17]  
 @ 0.008   @ 8.00   @ 80   @ 800  
 [N.B.: Correct answer 120.]
105. Which one of the following is the weight of gold bar? (Hard) [CB '17]  
 @ About 1 kg   @ About 1.16 kg  
**B** @ About 1.5 kg   @ About 1.75 kg
106. Length and breadth of your mathematics book is 25 cm and 19 cm respectively. What is the area of the book in square cm? (Medium) [DB '16]  
**A** @ 475   @ 457   @ 88   @ 44
107. The length of a box is 3 metres, breadth is 2 metres and height is 1.5 metres. What is the volume of the box? (Medium) [RB '16]  
 @ 9 cubic metres   @ 9 sq. metres  
**A** @ 6.5 metres   @ 6 cubit metres
108. The length is 4 metres, breadth is 3 metres and height is 2 metres of a box. What is the volume of it? (Medium) [JB '16]  
**B** @ 28   @ 24   @ 18   @ 9
109. The length is 4m, breadth is 3m and height is 2m of a reservoir. What is the volume of the reservoir in cubic centimetre? (Medium) [CB '16]  
 @ 24   @ 2.400  
**D** @ 2,40,000   @ 2,40,00,000
110. The length of a book is 25 cm and breadth is 18 cm. Number of pages of the book is 200. Thickness of each sheet is 0.1 mm then, what is the volume of the book in cubic cm? (Medium) [Rajuk Uttara Model College, Dhaka]  
**C** @ 4.5   @ 45   @ 450   @ 4500

111. The capacity of containing water of tank is 8000 litres. The length of the tank is 2.56 m and breadth is 1.25 m. What is the depth of the tank? (Medium) [Ideal School & College, Dhaka]  
**B** @ 1.5 m   @ 2.5 m   @ 3.5 m   @ 4.5 m
112. If the volume of a reservoir is 9 cubic metres, its length and breadth are 3 metres and 2 metres respectively. Its —. (Hard) [SB '18]  
 i. height is 1.5 metres  
 ii. area of base is 6 sq metres  
 iii. volume is 9000000 cubic cm  
 Which one of the following is correct?  
**D** @ i & ii   @ i & iii   @ ii & iii   @ i, ii & iii
113. If the volume of a reservoir is 9 cubic metres, its length and breadth are 3 metres and 2 metres respectively then its —. (Hard) [DJB '18]  
 i. height is 1.5 metres  
 ii. area of base is 6 sq metres  
 iii. volume is 900000 cubic cm  
 Which one of the following is correct?  
**A** @ i & ii   @ ii & iii   @ i & iii   @ i, ii & iii
114. If the length of a wall is 15 metres, breadth is 10 meters and thickness is 0.3 metres then —. (Hard) [SB '16]  
 i. the area is 150 sq. metres  
 ii. the perimeter is 50 metres  
 iii. the volume is 45 cubic metres  
 Which one is correct?  
**D** @ i & ii   @ i & iii   @ ii & iii   @ i, ii & iii
115. Volume of a cistern is  $9 \text{ m}^3$  and length is 3 metre and breadth is 2 metre then —. (Hard) [Rajuk Uttara Model College, Dhaka]  
 i. Height is 1.5 metre  
 ii. Area of bottom is  $6 \text{ m}^2$   
 iii. Volume is 900000 cubic deci m  
 Which one is correct?  
**A** @ i & ii   @ i & iii   @ ii & iii   @ i, ii & iii
- Answer questions from 116 to 119 based on the following information :  
 The length of a side of a cubical water tank is 3 metre.
116. What is the volume of the water tank? (Medium)  
 @ 9 cubic metre   @ 18 cubic metre  
**C** @ 27 cubic metre   @ 36 cubic metre
117. How much quantity of water in litre will the tank contain? (Hard)  
 @ 270 litre   @ 2700 litre  
**C** @ 27000 litre   @ 27 litre
118. How much quantity of water in kg will the tank contain? (Hard)  
**B** @ 27 kg   @ 27000 kg   @ 270 kg   @ 2700 kg
119. What is the total area of 6 sides of the tank? (Medium)  
 @ 50 sq. m.   @ 52 sq. m.  
**C** @ 54 sq. m.   @ 55 sq. m.

- Answer the questions no. 120 and 121 based on the following information :**

The length and breadth of a mathematics book is 11 inch and 9 inch respectively. [DjB '19]

- 120. What is the length of the book in metres? (Medium)**

Ⓐ 0.28 metres Ⓑ 0.40 metres

- Ⓑ 27.94 metres Ⓒ 30.27 metres

- 121. If the thickness of the book is 1 cm, then what is the volume of the book? (Hard)**

Ⓐ 234.79 cc Ⓑ 594.25 cc

- Ⓒ 618.75 cc Ⓓ 638.71 cc

- Answer the questions no. 122 and 123 according to the information given below :**

A open reservoir of length 8 metres, breadth 3.5 metres and height 100 centimetres. [DB '18]

- 122. What is the volume of the reservoir of water in cubic metre? (Medium)**

Ⓐ 14 Ⓑ 140 Ⓒ 400 Ⓓ 700

\*N.B. : Correct answer is 28

- 123. How much kgs of water does the reservoir contain? (Hard)**

Ⓐ 140000 Ⓑ 14000 Ⓒ 1400 Ⓓ 14

\*N.B. : Correct answer is 28000 kg

- Answer to the equations no. 124 and 125 based on the following information :**

The length of a side of a cubical tank is 4 metre.

- 124. What is the volume of the tank in cubic metres? (Medium) [RB '17]**

Ⓐ Ⓑ Ⓒ Ⓓ Ⓕ

- 125. How much water is there in the tank in Kg? (Hard) [RB '17]**

Ⓐ Ⓑ Ⓒ Ⓓ Ⓕ

- Answer the questions no. 126 and 127 in light of the following information :**

Gold is 19.3 times heavier than water. Length, breadth and height of a rectangular gold bar is 6 cm, 5 cm and 2 cm respectively.

- 126. Which one of the following is the volume of the gold bar? (Medium) [CB '17]**

Ⓐ 40 cubic cm Ⓑ 60 cubic cm

Ⓑ 80 cubic cm Ⓒ 100 cubic cm

- 127. Which one of the following is the weight of same volume of water of the gold bar? (Hard) [CB '17]**

Ⓐ Ⓑ Ⓒ Ⓓ Ⓕ

- Answer the questions no. 128 and 129 in the light of the following information :**

The length, width and height of an open reservoir of water are 2.5 metres, 2 metre and 10 cm. respectively.

- 128. What is the volume of the reservoir of water in cubic metre? (Medium) [CtgB '17]**

Ⓐ Ⓑ Ⓒ Ⓓ Ⓕ

- 129. How much kgs of water does the reservoir in sq. metre? (Hard) [CtgB '17]**

Ⓐ Ⓑ Ⓒ Ⓓ Ⓕ

## ► Short Q/A



## Designed as per topic



### ► 3.1 and 3.2 Concepts of Measurement and Units, Measurement in Metric System ➔ Textbook Page 29

**Question 1. What are 1 square unit and 1 cubic unit?**

**Solution :** In area measurement, a square with a side of 1 unit length is taken to be the unit of area and is termed as 1 square unit. Similarly, the volume of a cube with sides of 1 unit length is called 1 cube unit.

**Question 2. What do you mean by metre? Explain.**

**Solution :** The unit of measurement of length is metre. One part of 1 crore parts of the distance from the North Pole of the earth to the equator along the longitude over Paris is considered to be one metre. Later, the length of a rod made by platinum and iridium kept in Paris Museum has been recognised as one metre. Linear measurements are made considering this length as unit.

**Question 3. What do deca, hecto and kilo mean in Greek language?**

**Solution :** In Greek, deca means 10 times, hecto means 100 times and kilo means 1000 times.

**Question 4. What is the meaning of deci, centi and milli in Latin?**

**Solution :** In Latin, deci means one tenth, centi means one hundredth and milli means one thousandth.

**Question 5. What are the advantages of the metric system?**

**Solution :** The main advantages of metric system are :

- (i) It is decimal based; hence calculation is easy.
- (ii) Internationally recognized and used in almost all countries.
- (iii) Can be applied together in measuring length, weight and volume.
- (iv) Conversion from smaller to larger units is possible easily.

### ► 3.3 The units of measuring length

➔ Textbook Page 31

**Question 6. The length of a bridge is 6 km and 241 metres. Express it in millimetres.**

**Solution :** We know, 1 km = 1000 metres  
 $\therefore 6 \text{ km} = (1000 \times 6) \text{ metres} = 6000 \text{ metres}$

$$\begin{aligned} \text{Now, } 6 \text{ km and } 241 \text{ metres} &= (6000 + 241) \text{ metres} \\ &= 6241 \text{ metres} \\ &= (6241 \times 1000) \text{ millimetres} \\ &\quad [\because 1 \text{ m} = 1000 \text{ mm}] \\ &= 6241000 \text{ mm} \end{aligned}$$

∴ The length of the bridge is 6241000 mm.

**Question 7. How many feet and how many yards are equal to 4 nautical miles?**

**Solution :** We know, 1 nautical mile = 6080 feet  
 ∴ 4 nautical miles =  $(6080 \times 4)$  feet = 24320 feet

Again, 3 feet = 1 yard

$$\therefore 1 \text{ feet} = \frac{1}{3} \text{ yard}$$

$$\begin{aligned} \therefore 24320 \text{ feet} &= \frac{1 \times 24320}{3} \text{ yard} \\ &= 8106.67 \text{ yard (Approx.)} \end{aligned}$$

∴ 4 nautical miles = 24320 feet and 8106.67 yards (approx.).

**Question 8. 8 furlongs = how many inches?**

**Solution :** We know, 1 furlong = 220 yards  
 ∴ 8 furlongs =  $(220 \times 8)$  yard = 1760 yard  
 $= (1760 \times 3)$  feet  
 $\quad [\because 1 \text{ yard} = 3 \text{ inches}]$   
 $= 5280 \text{ inches}$   
 $= (5280 \times 12) \text{ inches}$   
 $\quad [\because 1 \text{ feet} = 12 \text{ inches}]$   
 $= 63360 \text{ inches}$

∴ 8 furlongs = 63360 inches.

**Question 9. A runner ran 25 rounds in a circular track of a length of 500 metres. How much distance did he run?**

**Solution :** 1 round is 500 metres.

$$\begin{aligned} \therefore \text{The distance of 25 rounds will be} &= (500 \times 25) \text{ metres} \\ &= 12500 \text{ metres} \\ &= 12000 \text{ metres} + 500 \text{ metres} \\ &= \frac{12000}{1000} \text{ k.m.} + 500 \text{ metres} \\ &= 12 \text{ k.m.} 500 \text{ metres} \end{aligned}$$

Required distance is 12 kilometres and 500 metres.

#### 3.4 Relation between British and Metric System

► Textbook Page 31

**Question 10. How many inches are there in 8 yards?**

**Solution :** We know, 1 yard = 0.9144 metre (approx.)  
 ∴ 8 yards =  $(0.9144 \times 8)$  metres (approx.)  
 $= 7.3152 \text{ metres (approx.)}$   
 $= 7.3152 \times 39.37 \text{ inches (approx.)}$   
 $\quad [\because 1 \text{ m.} = 39.37 \text{ inches (approx.)}]$   
 $= 287.999 \text{ inches (approx.)}$   
 $= 288 \text{ inches (approx.)}$

∴ There are 288 inches in 8 yards (approx.).

**Question 11. How many kilometres are there in 1.61 miles?**

**Solution :** We know, 1 mile = 1.61 km. (approx.)  
 ∴ 1.61 miles =  $(1.61 \times 1.61)$  km. (approx.)  
 $= 2.5921 \text{ km. (approx.)}$

∴ There are 2.5921 km in 1.61 miles. (approx.).

#### 3.5 Measurement of Weights

► Textbook Page 32

**Question 12. If an object weighs 3 kilograms 20 hectograms 200 decagrams 2000 grams what is the weight of the object?**

**Solution :** Here, 3 kilograms =  $(3 \times 1000)$  grams  
 $= 3000 \text{ grams}$   
 20 hectograms =  $(20 \times 100)$  grams = 2000 grams  
 200 decagrams =  $(200 \times 10)$  grams = 2000 grams  
 ∴ Weight of the object  
 $= (3000 + 2000 + 2000 + 2000) \text{ grams}$   
 $= 9000 \text{ grams}$   
 $= \frac{9000}{1000} \text{ kilograms}$

[∵ 1000 gram = 1 kilogram]

$$= 9 \text{ kilograms}$$

Required weight of the object is 9 kilograms.

**Question 13. If 3 metric tons of rice is divided equally among 75 workers, how much rice will each get?**

**Solution :** We know, 1 metric ton = 1000 kg  
 3 metric tons =  $(1000 \times 3)$  kg = 3000 kg  
 75 workers get 3000 kg  
 $\therefore 1 \text{ worker gets } \frac{3000}{75} \text{ kg} = 40 \text{ kg}$   
 ∴ Each worker gets 40 kg of rice.

#### 3.6 Measurement of Volume of Liquids

► Textbook Page 33

**Question 14. A tank is 5.5 metres long and 4 metres wide. The breadth of the tank is twice the height. How many litres of water will it contain?**

**Solution :** Given, length of the tank = 5.5 m  
 And breadth of the tank = 4 m  
 Since breadth is double of height, therefore breadth

$$= 2 \times \text{height}$$

Since breadth of the tank = height × 2

$$\begin{aligned} \text{Height of the tank} &= \frac{1}{2} \times \text{breadth} = \left(\frac{1}{2} \times 4\right) \text{ metres} \\ &= 2 \text{ metres} \end{aligned}$$

$$\begin{aligned} \text{Volume of the tank} &= (5.5 \times 4 \times 2) \text{ cubic metres} \\ &= 44 \text{ cubic m.} \end{aligned}$$

$$= (44 \times 1000000) \text{ cubic cm.}$$

$$= 44000000 \text{ cubic cm.}$$

$$= 44000 \text{ litres}$$

[∵ 1000 cubic cm. = 1 litre]

∴ The tank will contain 44000 litres of water.

**Question 15.** How many kilolitres are there in 500 decalitres?

**Solution :** We know,

$$10 \text{ decilitres} = 1 \text{ hectolitre}$$

$$\therefore 1 \text{ " } = \frac{1}{10} \text{ "}$$

$$\therefore 500 \text{ " } = \frac{500}{10} \text{ "}$$

$$= 50 \text{ hectolitres}$$

$$= \frac{50}{10} \text{ kilolitres } [\because 10 \text{ h.l.} = 1 \text{ k.l.}]$$

$$= 5 \text{ kilolitres}$$

$$\therefore 500 \text{ decalitres} = 5 \text{ kilolitres.}$$

**Question 16.** 2 litres = how many millilitres?

**Solution :** We know, 1 litre = 1000 millilitres

$$\therefore 2 \text{ litres} = (10 \times 2) \text{ decilitres} = 20 \text{ decilitres}$$

$$= (20 \times 100) \text{ millilitres}$$

$$[\because 1 \text{ decilitre} = 100 \text{ millilitres}]$$

$$= 2000 \text{ millilitres}$$

$$\therefore 2 \text{ litres} = 2000 \text{ millilitres.}$$

### 3.7 Measurement of Area Textbook Page 34

**Question 17.** If the base of a triangular land is 25 metres and the height is 12 metres, what is its area in square metres?

**Solution :** Given, base of the triangular land = 25 metre  
And height = 12 m

We know, area of triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$

$$\therefore \text{Area of triangular land} = \frac{1}{2} \times 25 \times 12 \text{ sq. metre}$$

$$= 150 \text{ sq. m}$$

Required area 150 sq. metre.

**Question 18.** If the perimeter of a square field is 20 yards, what is the area in square feet?

**Solution :** Given, perimeter of square field = 20 yards

$$\therefore \text{Length of one side of square field} = \frac{20}{4} \text{ yards}$$

$$= 5 \text{ yards}$$

$$\therefore \text{Area of the square field} = (\text{arm})^2$$

$$= (5)^2 \text{ sq. yards}$$

$$= 25 \text{ sq. yards}$$

$$= (25 \times 9) \text{ square yards}$$

$$[1 \text{ square yard} = 9 \text{ square feet}]$$

$$= 225 \text{ square yards}$$

Required area is 225 square feet.

**Question 19.** If the perimeter of a square field is 24 yards, what is the area of the field in square metres?

**Solution :** Given, perimeter of square field = 24 yards

$$\text{One side of square field} = \frac{24}{4} \text{ yards} = 6 \text{ yards}$$

$$\therefore \text{Area of square field} = 6^2 \text{ square yards}$$

$$= 36 \text{ square yards}$$

We know, 1 square yard = 0.84 square metres (approx.)

$$\therefore 36 \text{ square yards} = (0.84 \times 36) \text{ square metres}$$

$$= 30.24 \text{ square metres (approx.)}$$

Required area is 30.24 square metres (approx.).

**Question 20.** The rectangular garden has an area of 400 square metres and a breadth of 16 metres. What is the perimeter of the garden?

**Solution :** Let, length of rectangular garden = a metre

$$\therefore \text{Area of rectangular garden} = \text{length} \times \text{breadth}$$

$$= (a \times 16) \text{ square metre}$$

$$= 16a \text{ square metre}$$

$$\text{According to the question, } 16a = 400$$

$$\text{or, } a = \frac{400}{16} = 25$$

$$\text{Length of garden} = 25 \text{ m}$$

$$\therefore \text{Perimeter of garden} = 2(\text{length} + \text{breadth})$$

$$= 2(25 + 16) \text{ metres}$$

$$= (2 \times 41) \text{ metres}$$

$$= 82 \text{ metres}$$

Required perimeter is 82 metres.

**Question 21.** The length of a rectangular house is 6 metres more than the breadth and the perimeter is 64 metres. What is the area of the house?

**Solution :** Let, the breadth of the house = a metre

$$\therefore \text{Length of the house} = (a + 6) \text{ metres}$$

$$\therefore \text{Perimeter of the house} = 2 \times (a + a + 6) \text{ metres}$$

$$= 2 \times (2a + 6) \text{ metres}$$

$$\text{According to the question, } 2 \times (2a + 6) = 64$$

$$\text{or, } 2a + 6 = \frac{64}{2}$$

$$\text{or, } 2a + 6 = 32$$

$$\text{or, } 2a = 32 - 6$$

$$\text{or, } 2a = 26$$

$$\therefore a = \frac{26}{2} = 13$$

$$\therefore \text{Breadth} = 13 \text{ metre}$$

$$\text{And length of the house} = (a + 6) \text{ metres}$$

$$= (13 + 6) = 19 \text{ metres}$$

$$\text{Area of the house} = (19 \times 13) \text{ square metres}$$

$$= 247 \text{ square metres}$$

Required area is 247 square metres.

**Question 22.** If the length of a rectangle is one and a half times the breadth and the area is 384 square metres, find its length and breadth.

**Solution :** Let, the breadth of the rectangle = a metre

$$\therefore \text{Length of the rectangle} = 1.5a \text{ metre}$$

$$\therefore \text{Area of the rectangle} = (a \times 1.5a) \text{ square metres}$$

$$= 1.5 a^2 \text{ square metres}$$

$$\text{According to the question, } 1.5 a^2 = 384$$

$$\text{or, } a^2 = \frac{384}{1.5} = 256$$

$$\text{or, } a = \sqrt{256} = 16$$

$$\therefore \text{Breadth} = 16 \text{ metre}$$

$$\text{Length} = 1.5a = (1.5 \times 16) \text{ metre} = 24 \text{ metre}$$

Required length = 24 m and breadth = 16 m.



**Question 23.** A university campus area is 275 acres. Express it in hectares with the nearest integer.

**Solution :** We know, 2.47 acres = 1 hectare

$$\therefore 1 \text{ acre} = \frac{1}{2.47} \text{ hectares}$$

$$\therefore 275 \text{ acre} = \frac{1 \times 275}{2.47} \text{ hectares}$$

$$= 111.3360 \text{ hectares}$$

$$= 111 \text{ hectares (Approx.)}$$

Required area 111 hectares (approx.)

**Question 24.** If the length of a rectangular field is 12 m and breadth is 5 m, what is the length of its diagonal?

**Solution :** Given, length of rectangular field = 12 m  
And breadth of rectangular field = 5 m

$$\therefore \text{Length of diagonal of rectangular field}$$

$$= \sqrt{(\text{Length})^2 + (\text{Breadth})^2}$$

$$= \sqrt{(12)^2 + (5)^2} = \sqrt{144 + 25}$$

$$= \sqrt{169} = 13 \text{ metres}$$

Required length of the diagonal is 13 m.

**Question 25.** How many stones with an area of 2 square metres are required to cover a square floor of length 8 metres?

**Solution :** Area of square floor =  $(8)^2$  sq. metres  
= 64 sq. metres

Area of square stones = 2 sq. metres

$$\therefore \text{Stones required} = \frac{64}{2} = 32$$

Required number of stones is 32.

**Question 26.** A pond is 80 metres long and 60 metres wide. The breadth of the bank of the pond is 3 metres. Find the area of the bank.

**Solution :** Area of the pond =  $(80 \times 60)$  sq. metres  
= 4800 sq. metres

Length of pond with bank =  $\{80 + (3 + 3)\} = 86$  metres

Breadth of pond with bank =  $\{60 + (3 + 3)\} = 66$  metres

$$\therefore \text{Area of pond with bank} = (86 \times 66) \text{ sq. metres}$$

$$= 5676 \text{ sq. metres}$$

$$\therefore \text{Area of bank} = (5676 - 4800) \text{ sq. m} = 876 \text{ sq. m}$$

Required area of the bank 876 sq. m.

**Question 27.** The area of a rectangle is 10 acres, and its length is 5 times its breadth. What is the breadth of the field?

**Solution :** Area of rectangular field = 10 acres  
=  $(10 \times 4046.86)$  sq. metres = 40468.6 sq. metres

Let, breadth of rectangle = a metre

$\therefore$  Length of rectangle = 5a metre

$\therefore$  Area of rectangle =  $5a \times a = 5a^2$  sq. metres

According to the question,  $5a^2 = 40468.6$

$$\text{or, } a^2 = \frac{40468.6}{5} = 8093.72$$

$$\text{or, } a = \sqrt{8093.72} = 89.965 \text{ metres (Approx.)}$$

Required breadth of the rectangle is 89.965 m (approx.).

**Question 28.** A rectangular garden has length 30m and breadth 25m and 70 cm. There is a 2-metre-wide road around the inner side of the garden. Find the area of the garden excluding the road.

**Solution :** Given, the length of the garden = 30 m  
And the breadth of the garden = 25 m and 70 cm

$$= \left(25 + \frac{70}{100}\right) \text{ metres} [\because 100 \text{ cm} = 1 \text{ metres}]$$

$$= 25.7 \text{ metres}$$

$$\therefore \text{Length of the garden excluding road}$$

$$= \{30 - (2 + 2)\} = 26 \text{ metres}$$

$$\text{Breadth of the garden excluding road}$$

$$= \{25.7 - (2 + 2)\} = 21.7 \text{ metres}$$

$$\therefore \text{Area of the garden excluding road}$$

$$= (26 \times 21.7) \text{ sq. metres}$$

$$= 564.2 \text{ sq. metres}$$

Required area is 564.2 square metre.

**Question 29.** A square has a side length of 200 m and there is a 3.5m wide road in the outside. What is the area of the road?

**Solution :** Given, length of one side of a square = 200 m  
 $\therefore$  Area of square field =  $(200)^2$  sq. metres  
= 40000 sq. metres

$$\text{Area of the square including road}$$

$$= \{200 + (3.5 \times 2)\}^2 \text{ sq. metres}$$

$$= (200 + 7)^2 \text{ sq. metres}$$

$$= (207)^2 \text{ sq. metres}$$

$$= 42849 \text{ sq. metres}$$

$$\therefore \text{Area of the road} = (42849 - 40000) \text{ sq. metres}$$

$$= 2849 \text{ sq. metres}$$

Required area is 2849 square metre.

**Question 30.** The area of a triangular piece of land is 312 square metres. If its base is 24 m, find the height.

**Solution :** Let, height of the triangular land = a metre  
Given, base of the triangular land = 24 m

$$\text{We know, area of triangular field} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$\therefore \text{Area of the triangular land} = \frac{1}{2} \times 24 \times a \text{ sq. metre}$$

$$= 12a \text{ sq. metre}$$

According to the question,  $12a = 312$

$$\text{or, } a = \frac{312}{12} = 26$$

$\therefore$  Height = 26 metre

Required height of the land is 26 m.

### 3.8 Volume

► Textbook Page 37

**Question 31.** A box has length 2 m 30 cm, breadth 1 m and height 50 cm. What is the volume of the box in cubic metres?

**Solution :** Given, length of box = 2 m 30 cm  
=  $(2 \times 100) \text{ cm} + 30 \text{ cm}$   
=  $(200 + 30) \text{ cm} = 230 \text{ cm}$

$$\text{Breadth} = 1 \text{ metre} = (1 \times 100) \text{ cm.} = 100 \text{ cm}$$

And height = 50 cm

$$\begin{aligned}\therefore \text{Volume of the box} &= (230 \times 100 \times 50) \text{ cubic cm} \\ &= 1150000 \text{ cubic cm} \\ &= \frac{1150000}{1000000} \text{ cubic cm} \\ [\because 1000000 \text{ cubic cm}] &= 1.15 \text{ cubic m} \\ &= 1.15 \text{ cubic m}\end{aligned}$$

Required volume is 1.15 cubic metres.

**Question 32.** How many litres of water can a tank with a volume of 3 stayors contain?

**Solution :** We know, 1 stayor = 1 cubic metre

$$\begin{aligned}\therefore 3 \text{ stayors} &= (1 \times 3) = 3 \text{ cubic metres} \\ &= (3 \times 1000) \text{ litres } [\because 1 \text{ cubic m} = 1000 \text{ litres}] \\ &= 3000 \text{ litres}\end{aligned}$$

∴ The tank can contain 3000 litres of water.

**Question 33.** A tank can contain 10,000 litres of water. If the length of the tank is 3.25 m and the breadth is 1.5 m, what is the depth?

**Solution :** We know, 1000 litres = 1 cubic metre.

$$\begin{aligned}\therefore 1 \text{ litre} &= \frac{1}{1000} \text{ cubic metres} \\ \therefore 10000 \text{ litre} &= \frac{1 \times 10000}{1000} \text{ cubic metres} = 10 \text{ cubic metres} \\ \therefore \text{Volume of the tank} &= 10 \text{ cubic metres} \\ \text{Surface area of the tank} &= (3.25 \times 1.5) \text{ square metres} \\ &= 4.875 \text{ square metres} \\ \therefore \text{Depth of the tank} &= \frac{10}{4.875} \text{ metres} \\ &= 2.05 \text{ m (approx.)}\end{aligned}$$

Required depth is 2.05 m (approx.).

**Question 34.** Covering the floor of a house with carpet costs a total of Tk 1102.50 at the rate of Tk 7.50 per square metre. What is the area of the house in square metres?

**Solution :** Tk 7.50 is spent in 1 square metre

$$\begin{aligned}\therefore \text{Tk 1 is spent in } &\frac{1}{7.50} \text{ square metre} \\ \therefore \text{Tk 1102.50 is spent in } &\frac{1 \times 1102.50}{7.50} \text{ square metre} \\ &= \frac{147}{750 \times 100} " \\ &= 147 \text{ square metres}\end{aligned}$$

Required area is 147 square metres.

**Question 35.** Air is 0.00129 times heavier than water. How many kilograms of air are there in a house whose length, breadth and height are 16 metres, 12 metres and 3 metres respectively?

$$\begin{aligned}\text{Solution : Volume of the house} &= (16 \times 12 \times 3) \text{ cubic metres} \\ &= 576 \text{ cubic metres} \\ &= (576 \times 1000000) \text{ cubic cm} \\ [\because 1000000 \text{ cubic cm}] &= 576000000 \text{ cubic cm}\end{aligned}$$

Air is 0.00129 times heavier than water.

$$\begin{aligned}\therefore \text{Weight of 1 cubic cm. of air} &= 1 \text{ gram} \\ \therefore \text{The quantity of air in the house} &= (576000000 \times 0.00129) \text{ grams}\end{aligned}$$

$$\begin{aligned}&= 743040 \text{ grams} \\ &= \frac{743040}{1000} \text{ grams } [\because 1000 \text{ grams} = 1 \text{ kg}] \\ &= 743.04 \text{ kg}\end{aligned}$$

Required quantity of air is 743.04 kg.

**Question 36.** A tank can contain 25600 litres of water. What is the length of the tank if its depth is 2.56 m and breadth is 2.5 m?

**Solution :** Volume of the tank = 25600 litres

$$\begin{aligned}&= \frac{25600}{1000} \text{ cubic metre} \\ [1000 \text{ litre}] &= 1 \text{ cubic metre} \\ &= 25.6 \text{ Nb wgUvi}\end{aligned}$$

Let, length of the tank = a metre

$$\begin{aligned}\therefore \text{Area of the tank} &= (a \times 2.5 \times 2.56) \text{ cubic metres} \\ &= 6.4a \text{ cubic metres}\end{aligned}$$

According to the question, 6.4 a = 25.6

$$\text{or, } a = \frac{25.6}{6.4} = 4$$

∴ The length of the tank is 4 metres.

**Question 37.** A gold bar has a volume of 91.8 cubic cm. Gold is 19.3 times heavier than water. What is the weight of the gold bar in kg?

**Solution :** We know,

Weight of 1 cubic cm. of water = 1 gram

∴ Weight of 91.8 cubic cm. of water

$$= (91.8 \times 1) \text{ grams} = 91.8 \text{ grams}$$

Since, gold is 19.3 times heavier than water,

∴ Weight of 91.8 cubic cm. of gold = (91.8 × 19.3) grams

$$= 1771.74 \text{ grams}$$

$$= \frac{1771.74}{1000} \text{ kg}$$

$$[\because 1000 \text{ grams} = 1 \text{ kg}]$$

$$= 1.77174 \text{ kg}$$

Required weight of the gold bar is 1.77174 kg.

**Question 38.** The length, breadth and thickness of a piece of paper is 25 cm, 16 cm and 0.2 mm respectively. What is the volume of such 15 pieces of paper in cubic centimetres?

**Solution :** Given, length of a piece of paper = 25 cm,  
Breadth = 16 cm.

$$\text{And thickness} = 0.2 \text{ mm} = \frac{0.2}{10} = 0.02 \text{ cm}$$

$$\begin{aligned}\text{Volume of 1 piece of paper} &= (25 \times 16 \times 0.02) \text{ cubic cm} \\ &= 8 \text{ cubic cm}\end{aligned}$$

$$\begin{aligned}\therefore \text{Volume of 15 pieces of paper} &= (8 \times 15) \text{ cubic cm} \\ &= 120 \text{ cubic cm}\end{aligned}$$

Required volume is 120 cubic cm.



**Question 39.** The length and the breadth of a book are 25 cm. and 18 cm. The page number of the book is 100. The thickness of each sheet of paper of the book is 0.1 mm. What is the volume of the book in cubic cm?

**Solution :** Here, 100 pages =  $\frac{100}{2}$  sheets = 50 sheets

$$\text{Thickness of 1 sheet} = 0.1 \text{ mm}$$

$$\therefore \text{Thickness of 50 sheets} = (0.1 \times 50) \text{ mm.}$$

$$= 5 \text{ mm} = \frac{5}{10} \text{ cm} = 0.5 \text{ cm}$$

$$\therefore \text{Volume of the book} = \text{length} \times \text{breadth} \times \text{thickness}$$

$$= (25 \times 18 \times 0.5) \text{ cubic cm.}$$

$$= 225 \text{ cubic cm}$$

Required volume is 225 cubic cm.

**Question 40.** A tank is 4 metres long, 3 metres wide and 2 metres high. How many litres of water can it contain?

**Solution :** Volume of the tank = length × breadth × height  
 $= (4 \times 3 \times 2)$  cubic metres = 24 cubic metres

We know, 1 cubic metre = 1000 litres

$\therefore 24$  cubic metres =  $(1000 \times 24)$  litres = 24000 litres

$\therefore$  The tank can contain 24000 litres of water.

**Question 41. 1 cubic foot = how many litres?**

**Solution :** 1 cubic foot = 1 foot × 1 foot × 1 foot  
 $= 12 \text{ inches} \times 12 \text{ inches} \times 12 \text{ inches}$   
 $= (12 \times 2.54) \text{ cm} \times (12 \times 2.54) \text{ cm} \times (12 \times 2.54) \text{ cm}$   
 $= (30.48 \times 30.48 \times 30.48) \text{ cubic cm}$   
 $= 28316.846 \text{ cubic cm}$   
 $= \frac{28316.846}{1000} \text{ litre} [\because 1000 \text{ cubic cm} = 1 \text{ litre}]$   
 $= 28.32 \text{ litre (Approx.)}$

## Creative Q/A

Designed as per learning outcomes

**Ques. 01** The length of a rectangular garden is three times the breadth. An amount of Tk 1911 is spent to plant grass in the garden at Tk 13 per sq metre. The length, breadth and height of a room are 18 metres, 12 metres and 4 metres respectively.

- Express 8 inches in cm. 2
- Find the length and the breadth of the garden. 4
- If air is 0.00129 times heavier than water, then find how many kilograms of air are in the room? 4

● Dhaka Board 2019

**Solution to Question No. 01 :**

a We know,

$$1 \text{ inch} = 2.54 \text{ cm.}$$

$$\therefore 8 \text{ inches} = (8 \times 2.54) \text{ cm.}$$

$$= 20.32 \text{ cm.}$$

b Tk. 13 is spent for 1 sq. m

$$\therefore \text{Tk. } 1 \text{ " } " \text{ " } \frac{1}{13} \text{ sq. m}$$

$$\therefore \text{Tk. } 1911 \text{ " } " \text{ " } \frac{1 \times 1911}{13} \text{ sq. m}$$

$$= 147 \text{ sq. m}$$

The area of the garden is 147 sq. m

Let, the breadth =  $x$  m

$\therefore$  The length =  $3x$  m

$$\therefore \text{Area} = (\text{length} \times \text{breadth}) \text{ sq. units}$$

$$= (3x \times x) \text{ sq. m}$$

$$= 3x^2 \text{ sq. m}$$

According to the condition,

$$3x^2 = 147$$

$$\text{or, } x^2 = \frac{147}{3}$$

$$\text{or, } x^2 = 49$$

$$\text{or, } x = \sqrt{49}$$

$$\therefore x = 7$$

Therefore, breadth = 7 m

$$\text{and length} = (3 \times 7) \text{ m}$$

$$= 21 \text{ m.}$$

c Volume of the room = length × breadth × height

$$= 18 \text{ m} \times 12 \text{ m} \times 4 \text{ m}$$

$$= 864 \text{ cubic m}$$

$$= (864 \times 1000000) \text{ cubic cm.}$$

$$= 864000000 \text{ cubic cm.}$$

Air is 0.00129 times heavier than water.

$\therefore$  The weight of 1 cubic cm of air = 0.00129 grams

So, the quantity of air =  $(864000000 \times 0.00129)$  gm  
 $= 1114560$  gm  
 $= 1114.56 \text{ Kg}$

$\therefore$  There are 1114.56 kilograms of air in the room.

**Ques. 02** The length of a rectangular gold bar is 9.2 mm, the breadth is 6.8 mm and the height is 3.5 mm. Again an empty reservoir of length 4.50 metres, breadth 2.50 metres and height 1.25 metres and the reservoir is filled with water,

a. The area of a square is 4 arc (square decametre). What is the length of the square? 2

b. Gold is 19.3 times heavier than water. What is the weight of the gold bar in Kg? 4

c. What is the weight of water in the reservoir in Kg? 4

● Jashore Board 2019

**Solution to Question No. 02 :****a** We know,

$$1 \text{ are} = 100 \text{ sq metre.}$$

$$\therefore 4 \text{ are} = (4 \times 100) \text{ sq. metre} \\ = 400 \text{ sq. metre.}$$

Let, length of a side of the square = a

According to question,

$$a^2 = 400$$

$$\text{or, } a = \sqrt{400}$$

$$\therefore a = 20 \text{ (Ans.)}$$

**b** Given,

$$\text{Length of gold bar} = 9.2 \text{ mm}$$

$$= \frac{9.2}{10} \text{ cm} \\ = 0.92 \text{ cm}$$

$$\text{Breadth of gold bar} = 6.8 \text{ mm}$$

$$= \frac{6.8}{10} \text{ cm} \\ = 0.68 \text{ cm}$$

$$\text{and Height of gold bar} = 3.5 \text{ mm}$$

$$= \frac{3.5}{10} \text{ cm} \\ = 0.35 \text{ cm}$$

$$\therefore \text{Volume of the gold bar} = (0.92 \times 0.68 \times 0.35) \text{ cm}^3 \\ = 0.21896 \text{ cm}^3$$

We know, weight of 1  $\text{cm}^3$  water = 1 gm. Since, gold is 19.3 times heavier than water.

Then weight of gold is  $= 21896 \times 19.3 \text{ g}$ 

$$= 4.23 \text{ gm} \\ = \frac{4.23}{1000} \text{ kg} \\ = 0.00423 \text{ kg}$$

**c** Given,

$$\text{Length of the reservoir} = 4.5 \text{ m}$$

$$\text{Breadth } " " " = 2.5 \text{ m}$$

$$\text{and Height } " " " = 1.25 \text{ m}$$

$$\therefore \text{Volume of reservoir} = \text{Length} \times \text{Breadth} \times \text{Height} \\ = (4.5 \times 2.5 \times 1.25) \text{ m}^3 \\ = 14.0625 \text{ m}^3$$

According to condition,

$$\text{Volume of water} = \text{volume of reservoir}$$

$$\therefore \text{Volume of water} = 14.0625 \text{ m}^3.$$

We know,

$$1 \text{ m}^3 = 1000 \text{ Litre}$$

$$\therefore 14.0625 \text{ m}^3 = (14.0625 \times 1000) \text{ litre} \\ = 14062.5 \text{ Litre}$$

Now, the weight of 1 Litre water = 1 Kg

$$\therefore " " " 14062.5 " " = 14062.5 \text{ Kg (Ans.)}$$

**Ques. 03** The area of a rectangular park is 10 acres and its length is 3 times of the breadth. There is a road of width 2 metres around its outside :

a. Express 3 acres in sq yard. 2

b. Determine the area of the road. 4

c. A pond is dug whose area is equal to the perimeter of the park and its depth is 2 metres. What is the amount of water in Kg in that pond? 4

● Dinajpur Board 2019

**Solution to Question No. 03 :****a** We know,

$$1 \text{ acre} = 4840 \text{ sq. yards}$$

$$\therefore 3 \text{ acres} = (4840 \times 3) \text{ sq. yards} \\ = 14520 \text{ sq. yards (Ans.)}$$

**b** Let, breadth of the park = x metre

$$\therefore \text{length of the park} = 3x \text{ metre}$$

$$\therefore \text{Area of the park} = (3x \times x) \text{ sq metre} \\ = 3x^2 \text{ sq. metre}$$

According to question,

$$3x^2 = 10 \times 4046.86 [\because 1 \text{ acre} = 4046.86 \text{ sq.m.}]$$

$$\text{or, } x^2 = \frac{40468.6}{3}$$

$$\text{or, } x^2 = 13489.53$$

$$\text{or, } x = \sqrt{13489.53}$$

$$\therefore x = 116.14 \text{ metre}$$

$$\therefore \text{Breadth of park} = 116.14 \text{ metre}$$

$$\text{and length of the park} = (3 \times 116.14) \text{ metre} \\ = 348.42 \text{ metre}$$

Again, given width of road = 2 metre

$$\text{Now, length of the park with road} = (348.42 + 2 \times 2) \text{ metre} \\ = 352.42 \text{ metre}$$

$$\text{breadth of the park with road} = (116.14 + 2 \times 2) \text{ metre} \\ = 120.14 \text{ metre}$$

$$\therefore \text{The area of the park including road} = (352.42 \times 120.14) \text{ sq. metre} \\ = 42339.74 \text{ sq. metre}$$

$$\therefore \text{Area of the road} = (42339.74 - 40468.6) \text{ sq. metre} \\ = 1871.14 \text{ sq. metre (Ans.)}$$

**c** From 'b' we get,

$$\text{length of the park} = 348.42 \text{ metre}$$

$$\text{breadth of the park} = 116.14 \text{ metre}$$

$$\therefore \text{Perimeter of the park} = 2(\text{Length} + \text{Breadth}) \\ = 2(348.42 + 116.14) \text{ metre} \\ = 929.12 \text{ metre}$$

According to the question,

$$\text{Area of pond} = 929.12 \text{ sq. metre}$$

$$\text{Given, depth of pond} = 2 \text{ metre}$$

$$\text{Volume of pond} = \text{Area} \times \text{Depth}$$

$$= (929.12 \times 2) \text{ cubic m}$$

$$= 1858.24 \text{ cubic m}$$

According to question,

$$\begin{aligned}\text{Amount of water in pond} &= 1858.24 \text{ cubic m.} \\ &= 1858.24 \times 1000 \text{ kg} \\ &= 1858240 \text{ kg (Ans.)}\end{aligned}$$

**Ques. 04** The length of a rectangular garden is 50m. its breadth is 40 m. In the middle of the garden a pond is dug with 3m. depth whose bank is 3m. wide.

- a. Determine how many metres in a yard. 2
- b. Find out the weight of the water in the pond. 4
- c. There is a 4 metres wide road around the outside of a square land which perimeter is equal to the rectangular garden. Find the area of the road. 4

● Cumilla Board 2018

#### Solution to Question No. 04 :

a We know, 1 yard = 3 ft  
 $= (3 \times 12) \text{ inch } [\because 1 \text{ ft} = 12 \text{ inch}]$   
 $= 36 \text{ inch}$   
 $= (36 \times 2.54) \text{ cm } [\because 1 \text{ inch} = 2.54 \text{ cm}]$   
 $= 91.44 \text{ cm}$   
 $= \frac{91.44}{100} \text{ m } [\because 1 \text{ m} = 100 \text{ cm}]$   
 $= 0.9144 \text{ m}$

1 yard = 0.9144 m.

b Given,

Length of rectangular gander = 50 m and breadth 40 m  
 $\therefore$  Length of pond including bank = 50 m  
 and breadth of pond including bank = 40 m  
 $\therefore$  Length of pond excluding bank

$$\begin{aligned}&= \{50 - (3 \times 2)\} \text{ m} \\ &= (50 - 6) \text{ m} = 44 \text{ m}\end{aligned}$$

Breadth of pond excluding bank,

$$\begin{aligned}&= \{40 - (3 \times 2)\} \text{ m} \\ &= (40 - 6) \text{ m} = 34 \text{ m}\end{aligned}$$

$$\therefore \text{Area of pond excluding bank} = (44 \times 34) \text{ sq. m} = 1496 \text{ sq. m}$$

Now, Depth of pond = 3 m

$$\begin{aligned}\therefore \text{Volume of pond} &= (1496 \times 3) \text{ cu. m} \\ &= 4488 \text{ cu. m} \\ &= (4488 \times 1000) \text{ litre} \\ &\quad [\because 1 \text{ cu. m} = 1000 \text{ litre}] \\ &= 4488000 \text{ litre}\end{aligned}$$

We know,

Weight of 1 L water 1 kg

$$\therefore " 4 " 488000 " " = 1 \times 4488000 " = 4488000 \text{ kg}$$

∴ So, weight of pond water 4488000 kg.

c Given length of rectangular gander = 50 m  
 And, breadth of rectangular gander = 40 m  
 $\therefore$  Perimeter of gander =  $2(50 + 40)$  m  
 $= (2 \times 90) \text{ m} = 180 \text{ m}$

As perimeter of gander = perimeter of square,

$$\therefore \text{perimeter of square} = 180 \text{ m}$$

$$\therefore \text{Length of one side of square} = \frac{180}{4} \text{ m} = 45 \text{ m}$$

$$\therefore \text{Area of square} = (45)^2 \text{ sq. m} = 2025 \text{ sq. m}$$

Length of one side of square including road

$$= \{45 + (4 \times 2)\} \text{ m}$$

$$= (45 + 8) \text{ m} = 53 \text{ m}$$

$$\therefore \text{Area of square including road} = (53)^2 \text{ sq. m} = 2809 \text{ sq. m}$$

$$\therefore \text{Area of road} = (2809 - 2025) \text{ sq. m} = 784 \text{ sq. m}$$

∴ Area of road is 784 sq. m.

**Ques. 05** Gold is 19.3 times heavier than water.

The length of a rectangular gold bar is 4.4 cm, breadth is 3.2 cm. and height is 1.4 cm. An ornament is made by the given gold along with one-fourth copper of that gold. The market rate of gold is Tk. 3000 per gram, copper is Tk. 30 per gram and the making charge is Tk. 3000 to make the ornament.

- a. Find the volume of the gold bar? 2
- b. What is the weight of the gold bar in gram? 4
- c. Determine the total value of the ornament. 4

● Rajshahi Board 2017

#### Solution to Question No. 05 :

a For a gold bar,  
 length = 4.4 cm, breadth = 3.2 cm and height = 1.4 cm.  
 $\therefore$  Volume of the gold bar = length  $\times$  breadth  $\times$  height  
 $= 4.4 \text{ cm} \times 3.2 \text{ cm} \times 1.4 \text{ cm}$   
 $= 19.712 \text{ cu. cm.}$

b According to the problem, gold is 19.3 times heavier than water, means weight of a unit of gold is 19.3 time the weight of the same amount of water.

We know,

$$\text{Weight of 1 cu cm of water} = 1 \text{ gm.}$$

$$\therefore \text{Weight of } 19.712 \text{ cu. cm of water} = 19.712 \text{ gm.}$$

$$\therefore \text{Weight of } 19.712 \text{ cu cm of gold} = 19.712 \times 19.3 \text{ gm}$$

$$= 380.44 \text{ gm (approx.)}$$

∴ The determined weight of gold is 380.44 gm.

c From 'b', weight of gold bar = 380.4416 gm

$$\begin{aligned}\text{One fourth of gold bar} &= \left( 380.4416 \times \frac{1}{4} \right) \text{ gm} \\ &= 95.1104 \text{ gm}\end{aligned}$$

$$\therefore \text{Amount of Copper} = 95.1104 \text{ gm}$$

Now, 1 gm gold costs 3000 taka

$$\therefore 380.4416 " " 3000 \times 380.4416 \text{ taka}$$

$$= 1141324.80 \text{ taka}$$

And 1 gm copper costs 30 taka  
 $\therefore 95.1104 \text{ " } " = 30 \times 95.1104 \text{ taka}$   
 $= 2853.312 \text{ taka}$

Making charge = 3000 taka  
 $\therefore \text{Total cost} = (1141324.80 + 2853.312 + 3000)$   
 $= 1147178.11 \text{ taka (Approx.)}$

**Ques. 06** The inner length is 15 cm 2.4 mm, breadth 7 cm 6.2 mm and height 5 cm 8 mm of a small iron box.

- a. Find out the inner length in millimetre of iron box. 2
- b. Evaluate the inner area of the whole face of the box. 4
- c. The length, breadth and height of the gold bar 13.47 cm, 1.5 cm and 1 cm respectively. Find out the highest number of gold bar which can be kept in that box? Find out it. 4

© Cumilla Board 2017

### Solution to Question No. 06 :

a Given, inner length of box = 15 cm 2.4 mm  
 $= (15 \times 10) \text{ mm} + 2.4 \text{ mm}$   
 $= (150 + 2.4) \text{ mm} = 152.4 \text{ mm}$

$\therefore$  Inner length of the box 152.4 mm.

b Given,

Inner length of the box = 15 cm 2.4 mm  
 $= \left(15 + \frac{2.4}{10}\right) \text{ cm}$   
 $= (15 + 0.24) \text{ cm}$   
 $= 15.24 \text{ cm}$

Inner breadth of the box = 7 cm 6.2 mm  
 $= \left(7 + \frac{6.2}{10}\right) \text{ cm}$   
 $= (7 + 0.62) \text{ cm}$   
 $= 7.62 \text{ cm}$

Inner height of the box = 5 cm 8 mm  
 $= \left(5 + \frac{8}{10}\right) \text{ cm}$   
 $= (5 + 0.8) \text{ cm}$   
 $= 5.8 \text{ mm}$

$\therefore$  Inner area of whole surface  
 $= 2(15.24 \times 7.62 + 7.62 \times 5.8 + 5.8 \times 15.24) \text{ sq. m}$   
 $= 497.43 \text{ sq. m (Approx.)}$

c The inner volume of the box = Length  $\times$  Height  $\times$  Breadth  
 $= 152.4 \text{ mm} \times 76.2 \text{ mm} \times 58 \text{ mm}$   
 $= 673547.04 \text{ cu mm}$   
 $= 673.55 \text{ cu. cm (approx.)}$

Again, volume of a gold bar =  $(13.47 \times 1.5 \times 1) \text{ cu. cm}$   
 $= 20.205 \text{ cu. cm}$

$\therefore$  The number of gold bar which can exactly accommodated in the iron box =  $\frac{673.55 \text{ cu cm}}{20.205 \text{ cu cm}}$   
 $= 33.34$  or 33

Therefore, the highest number of gold bar which can be kept in the box is 33.

**Ques. 07** The length of floor of a room is  $1\frac{1}{2}$  times of the width. The height of the room is 4 meters. Area of the floor is 150 sq. meters. An amount of Tk. 7500 is spent to cover the floor with 50 cm. square stone.

- a. What is the width of the room in metres? 2
- b. What is the price of each square stone? 4
- c. What is the weight of water in kgs contained in a reservoir equal to the volume of the room? 4

● Chattogram Board 2017

### Solution to Question No. 07 :

a Let, the width of the floor =  $x \text{ m}$

$\therefore$  The length of the floor =  $\frac{3x}{2} \text{ m}$

$\therefore$  Area of the floor =  $\left(\frac{3x}{2} \times x\right) \text{ sq. m}$

Now according to question,

$$\frac{3x}{2} \times x = 150$$

or,  $\frac{3x^2}{2} = 150$

or,  $3x^2 = 300$

or,  $x^2 = 100$

or,  $x = 10$

$\therefore$  The width of the room is 10 m.

b  $150 \text{ sq. m} = (150 \times 100 \times 100) \text{ sq. cm}$   
 $= 1500000 \text{ sq. cm}$

Again, area of 1 sq. stone =  $50 \text{ cm} \times 50 \text{ cm}$   
 $= 2500 \text{ sq. cm}$

$\therefore$  Number of stones needed to cover the floor  
 $= \frac{1500000}{2500} = 600$

Now according to question,

the price of 600 stones = 7500 taka

$\therefore$  The price of 1 stone =  $\frac{7500}{600} \text{ taka}$   
 $= 12.5 \text{ taka}$

So, the price of each square stone is 12.5 taka.

c Here height of the room = 4 m

length of the room =  $10 \times \frac{3}{2} \text{ m} = 15 \text{ m}$ , from (a)  
width of the room = 10 m, from (a) above

$$\therefore \text{Volume of the room} = \text{Length} \times \text{Height} \times \text{Breadth}$$

$$= 4 \times 15 \times 10 \text{ cu. m}$$

$$= 600 \text{ cu. m.}$$

We know, weight of 1 cu. m water = 1000 kg  
 $\therefore \text{Weight of } 600 \text{ cu. m} = 600 \times 1000 \text{ kg}$   
 $= 600000 \text{ kg}$

- Ques. 08** The air is 0.00129 times heavier than the water. The length of floor, breadth of the floor and height of a house are 20 meter, 10 meter and 5 meter respectively.
- Find the area of the floor of the house. 2
  - How many kilogram air are there in the house? 4
  - Find the volume of the four walls of the house if the thickness of the wall is 12 cm. 4

● Sylhet Board 2017

### Solution to Question No. 08 :

a. Length of floor = 20 m and breadth = 10 m  
 $\therefore \text{Area} = \text{Length} \times \text{Breadth} = (20 \times 10) = 200 \text{ m}^2$

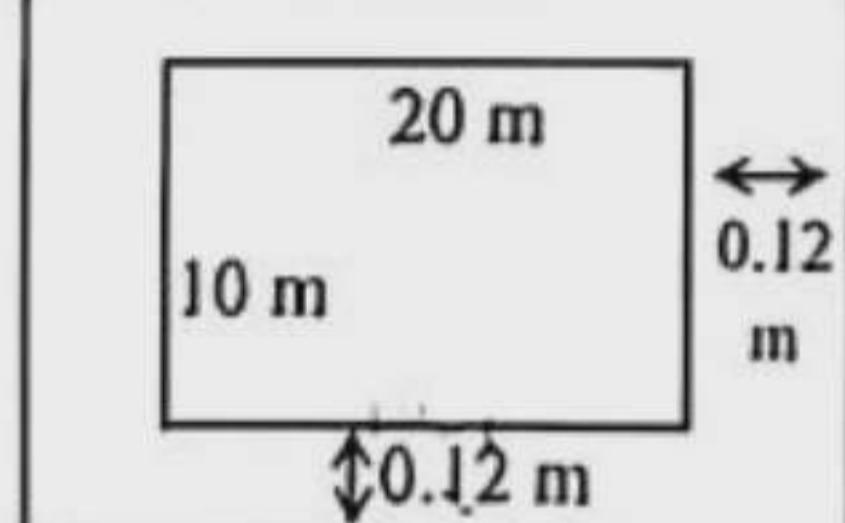
b. Volume of house = length  $\times$  breadth  $\times$  height  
 $= 20 \text{ m} \times 10 \text{ m} \times 5 \text{ m}$   
 $= 1000 \text{ m}^3$   
 $= 1000 \times 1000000 \text{ cm}^3$   
 $= 1000000000 \text{ cm}^3$

Air is 0.00129 times heavier than water.

$$\therefore \text{The weight of } 1 \text{ cm}^3 \text{ of air} = 0.00129 \text{ grams.}$$

$$\therefore \text{So the quantity of air} = (1000000000 \times 0.00129)$$
 $= 1290000 \text{ gm}$ 
 $= 1290 \text{ kg}$

c. Given, Length of reservoir = 20 m  
 Breadth = 10 m and height = 5 m  
 $\text{Thickness of wall} = 12 \text{ cm} = \frac{12}{100} \text{ m} = 0.12 \text{ m}$



Now, volume of 2 walls along length  
 $= (20 + 2 \times 0.12) \times 5 \times 0.12 \times 2 \text{ cu. m}$   
 $= 24.288 \text{ cu. m}$

And volume of 2 walls along breadth  
 $= (10 \times 5 \times 0.12 \times 2) \text{ cu. m}$   
 $= 12 \text{ cu. m}$

$$\therefore \text{Volume of four walls} = (24.288 + 12) \text{ cu. m}$$
 $= 36.288 \text{ cu. m}$

$\therefore \text{Volume of four walls } 36.288 \text{ cu. m.}$

- Ques. 09** The length, breadth and height of a tank are 4.50 metres, 2.50 metres and 1.50 metres respectively.
- The area of a field of a school is 3 acres. Express it in square metre. 2
  - What is the capacity of the tank in litre? 4
  - Determine the area of four walls of the tank. 4

● Jashore Board 2018

### Solution to Question No. 09 :

a. We know, 1 acre = 4046.86 sq. m.  
 $\therefore 3 \text{ acres} = 3 \times 4046.86 \text{ sq. m}$   
 $= 12140.58 \text{ m}^2$

The determined area of the field is  $12140.58 \text{ m}^2$ .

b. Here,

$$\begin{aligned} \text{Volume of the tank} &= \text{Length} \times \text{Breadth} \times \text{Depth} \\ &= 4.50 \times 2.50 \times 1.50 \text{ m}^3 \\ &= 16.875 \text{ m}^3 \\ &= 16.875 \times 1000000 \text{ cm}^3 \\ &= 16875000 \text{ cm}^3 \\ &= 16875 \text{ litre} \quad [1 \text{ litre} = 1000 \text{ cm}^3] \\ &= 1000 \text{ cm}^3 \end{aligned}$$

c. Here, length of reservoir 4.5 m, breadth 2.50 m and height 1.5 m

$$\begin{aligned} \text{Area of two walls along length} &= (2 \times 4.5 \times 1.5) \text{ sq. m} \\ &= 13.5 \text{ sq. m} \end{aligned}$$

$$\begin{aligned} \text{Area of two walls along breadth} &= (2 \times 2.5 \times 1.5) \text{ sq. m} \\ &= 7.5 \text{ sq. m} \end{aligned}$$

$$\therefore \text{Total area of four walls} = (13.5 + 7.5) \text{ sq. m}$$
 $= 21 \text{ sq. m}$

Area of four walls is 21 sq. m.

**Ques. 10** The length of a garden is one and half times of its breadth and area is 2400 sq metres. There are two crosswise roads of width 2 metres just in the middle of the garden.

- Express 15 metres and 75 centimetres in millimetres. 2
- Determine the perimeter of the garden. 4
- Determine the total area of the two roads. 4

● Cumilla Board 2019

### Solution to Question No. 10 :

a. We know,  
 1 meter = 1000 millimeters  
 $\therefore 15 \text{ meters} = (15 \times 1000) \text{ millimeters}$   
 $= 15000 \text{ millimeters.}$

and 1 centimeter = 100 millimeters

$$\therefore 75 \text{ centimeters} = (75 \times 100) \text{ millimeters}$$
 $= 7500 \text{ millimeters}$

$$\therefore 15 \text{ meters and } 75 \text{ centimeters} = (15000 + 7500) \text{ millimeters}$$
 $= 15750 \text{ millimeters}$

b. Let, breadth of the road = a meter  
 $\therefore \text{Length } " \text{ road} = \left(1 + \frac{1}{2}\right)a \text{ meter}$   
 $= \frac{3}{2}a \text{ meter}$

$$\therefore \text{Area of the road} = \frac{3}{2}a \times a \text{ sq. meter}$$
 $= \frac{3}{2}a^2 \text{ sq. meter}$

According to question,

$$\frac{3}{2}a^2 = 2400$$

$$\text{or, } a^2 = 1600$$

$$\therefore a = 40$$

Therefore, breadth of the road = 40 meters  
and length of the road =  $40 \times \frac{3}{2}$  meters  
= 60 meters  
We know, Perimeter of the garden = 2 (length + breadth)  
= 2(60 + 40) meters  
= 200 meters

c) From 'b' we get,  
length of the road = 60 meters  
and breadth of the road = 40 meters  
Given, width of the road = 2 meters  
Now,

$$\begin{aligned}\text{Area of road along length} &= (60 \times 2) \text{ sq. meters} \\ &= 120 \text{ sq. meters} \\ \text{and Area of road along breadth} &= (40 - 2) \times 2 \text{ sq. meters} \\ &= 38 \times 2 \text{ sq. meters} \\ &= 76 \text{ sq. meters} \\ \therefore \text{Total area of two road} &= (120 + 76) \text{ sq. meters} \\ &= 196 \text{ sq. meters (Ans.)}\end{aligned}$$

**Ques. 11** The length and breadth of inner side of an open reservoir are 3.8 m and 1.25 m. The reservoir contains 9500 litres water. To put tile's sheet Tk 200 is spent for per sq metre.

- Determine the length of the diagonal of the rectangle of length 16 metre and breadth 12 metre. 2
- Find the depth of the reservoir. 4
- How much money will be spent to put tile's sheet in the inner side of the reservoir? 4

● Chatogram Board 2019

### Solution to Question No. 11 :

a) Given,  
length of the rectangle = 16 metre  
and breadth of the rectangle = 12 metre  
 $\therefore$  Length of diagonal of the rectangle =  $\sqrt{16^2 + 12^2}$  metre  
= 20 metre.

b) The area of the bottom =  $(3.8 \times 1.25)$  sq. metre  
= 4.75 sq. metre  
= 47500 sq. cm

The capacity of containing water is 9500 liters or  $(9500 \times 1000)$  cc [1 liter = 1000 cc]  
Therefore, the volume is 9500000 cubic cm

$\therefore$  The depth of the reservoir =  $\frac{9500000}{47500}$  cm  
= 200 cm  
= 2 metre

$\therefore$  Determined depth of the reservoir is 2 metre.

c) Given,  
length of the reservoir = 3.8 m,  
breadth of the reservoir = 1.25 m  
and depth of the reservoir = 2m  
Area of the lower plane of the reservoir  
= (length  $\times$  breadth) sq. unit  
=  $(3.8 \times 1.25)$  sq. m.  
= 4.75 sq. m.

And area of the sides

$$\begin{aligned}&= \{2(\text{length} \times \text{depth}) + 2(\text{breadth} \times \text{depth})\} \text{ sq. unit} \\ &= \{2(3.8 \times 2) + 2(1.25 \times 2)\} \text{ sq. m.} \\ &= (15.2 + 5) \text{ sq. m.} \\ &= 20.2 \text{ sq. m.}\end{aligned}$$

$$\therefore \text{Area of the inner side of the reservoir}$$

$$\begin{aligned}&= (4.75 + 20.2) \text{ sq. m.} \\ &= 24.95 \text{ sq. m.}\end{aligned}$$

If per sq. m. costs Tk. 200 then the money will be spent to put tile's sheet in the inner side of the reservoir = Tk.  $(24.95 \times 200)$   
= Tk. 4990

$\therefore$  Tk. 4990 will be spent to put tile's sheet in the inner side of the reservoir.

**Ques. 12** The length of a pond is 54 metres and breadth is 36 metres and 50 centimeters. Its bank around inside is 2.5 metres wide and depth is 6 metres.

- Find the perimeter of the pond. 2
- Find out the area of the bank of the pond. 4
- How much time is required to empty the pond, when 0.2 cubic metre water is emptied per minute by a machine? 4

● Dhaka Board 2018

### Solution to Question No. 12 :

a) Here, length = 54m and  
breadth = 36m 50cm = 36.5 m.

$$\therefore \text{Perimeter of the pond} = 2(54 + 36.5)m = 181m.$$

b) Given, Length of pond 54 m  
and breadth 36.5 m

$$\begin{aligned}\therefore \text{Are of the pond} &= (\text{Length} \times \text{Breadth}) \text{ sq. unit} \\ &= (54 \times 36.5) \text{ sq. m} = 1971 \text{ sq. m}\end{aligned}$$

Length of pond including bank

$$\begin{aligned}&= \{54 + (2 \times 2.5)\} m \\ &= (54 + 5) m = 59 m\end{aligned}$$

$$\begin{aligned}\text{Breadth of pond including bank} &= \{36.5 + (2 \times 2.5)\} m \\ &= (36.5 + 5) m = 41.5 m\end{aligned}$$

$$\begin{aligned}\therefore \text{Are of including bank} &= (59 \times 41.5) \text{ sq. m.} \\ &= 2448.5 \text{ sq. m.}\end{aligned}$$

$$\begin{aligned}\therefore \text{Area of bank} &= \text{Area of pond including bank} - \text{Area of pond} \\ &= (2448.5 - 1971) \text{ sq. m.} \\ &= 477.5 \text{ sq. m.}\end{aligned}$$

$\therefore$  Area of bank is 477.5 sq. m

$$\begin{aligned}\text{c) Volume of pond} &= (\text{Length} \times \text{Breadth} \times \text{Depth}) \text{ cu. m.} \\ &= (54 \times 36.5 \times 6) \text{ cu. m.} \\ &= 11826 \text{ cu. m.}\end{aligned}$$

0.2 cu. m water is emtied in 1 second

$$\therefore 1 \text{ " } " \text{ " } " \text{ " } \frac{1}{0.2} \text{ " }$$



$$\therefore 11826 \text{ " " " } = \frac{1 \times 11826}{0.2} \text{ "}$$

$$= 59130 \text{ second}$$

$$= \frac{59130}{60} \text{ minute}$$

[∴ 60 second = 1 minute]

$$= 985 \text{ hour 30 second}$$

$$= \frac{985}{60} \text{ hour 30 second}$$

[∴ 60 minute = 1 hour]

$$= 16 \text{ hour 25 minute 30 second}$$

∴ Total time required is 16 hours 25 minutes and 30 seconds.

**Ques. 13** The length of a rectangular region is three times of its breadth. Tk. 955.50 is spent to set the tiles in it at the rate of Tk. 6.50 per square metre. There is a 2 metres wide road around outside of that region.

- a. If the breadth is 'a' metre of the rectangular region express its perimeter by 'a'. 2
- b. Determine the length and breadth of the rectangular region. 4
- c. Determine the area of the road. 4

● Barishal Board 2018

#### Solution to Question No. 13 :

a: According to the given information, if 'a' m is the breadth of the rectangular region, then length of the region = 3a m.

$$\therefore \text{Perimeter of the region} = 2(3a + a) \text{ m} = 8a \text{ m.}$$

b: From (a) above,

$$\text{hypothetical area of the rectangular region} = 3a \times a \text{ sq m} = 3a^2 \text{ sq m. .... (i)}$$

But based on given information,

$$\text{area of the given region} = \frac{955.5 \text{ taka}}{6.5 \text{ taka}} \text{ sq. m.}$$

$$= 147 \text{ sq. m. .... (ii)}$$

∴ From (1) and (2), we get,

$$3a^2 = 147 \Rightarrow a^2 = 49 \Rightarrow a = 7$$

That is, breadth of the rectangular region is 7 m.

$$\therefore \text{Length of the region} = 7 \times 3 \text{ m} = 21 \text{ m}$$

So, the determined length = 21 m and

$$\text{ " " " breadth " } = 7 \text{ m}$$

c: From (b) above,

Length of the rectangular region = 21 m and

$$\text{breadth " " " " } = 7 \text{ m}$$

$$\therefore \text{area of the region excluding road} = 21 \times 7 \text{ sq. m.} \\ = 147 \text{ sq. m.}$$

Again, length of the region including road of width of 2m =  $(21 + 2 \times 2)$  m or, 25 m and breadth of the same including road of width 2m =  $(7 + 2 \times 2)$  m = 11 m

$$\therefore \text{area of the region including road of width 2m outside around the region} = (25 \times 11) \text{ sq m} = 275 \text{ sq. m.}$$

$$\therefore \text{Area of the road} = (275 - 147) \text{ sq. m.} \\ = 128 \text{ sq. m.}$$

So, the determined area of the road is 128 sq. m.

**Ques. 14** Length, breadth and thickness of an iron sheet is 5 metre, 3 metre and 0.02 metre respectively. Blades of fan would be made by melting that iron sheet. Length, breadth and thickness of each blade of fan is 1 metre, 0.25 metre and 0.01 metre respectively. There are 3 blades in each fan. Iron is 7.5 times heavier than water.

- a. Determine the length of diagonal of a rectangle whose length is 16 metre and breadth is 12 metre. 2
- b. Find the weight of iron sheet in kg. 4
- c. How many fans can be made with that iron sheet? 4

● RAJUK Uttara Model College, Dhaka

#### Solution to Question No. 14 :

a Given that

$$\text{Length of the rectangle} = 16 \text{ m}$$

$$\text{Breadth of the rectangle} = 12 \text{ m}$$

We know,

$$\begin{aligned}\text{Length of diagonal} &= \sqrt{\text{length}^2 + \text{breadth}^2} \text{ metre} \\ &= \sqrt{16^2 + 12^2} \text{ metre} \\ &= 20 \text{ metres}\end{aligned}$$

∴ Length of diagonal 50 metre. (Ans.)

b Given that

$$\text{Length of the iron sheet is 5 metres}$$

$$\text{Breadth of the iron sheet is 3 metres}$$

$$\text{Thickness of the iron sheet is 0.02 metre}$$

∴ Volume of the iron sheet is

$$\begin{aligned}&= (5 \times 3 \times 0.02) \text{ cubic m} \\ &= 0.3 \text{ cubic metre}\end{aligned}$$

Iron is 7.5 times heavier than water.

We know,

$$\text{Weight of 1 cubic metre water is 1000 kg}$$

$$\therefore \text{Weight of 1 cubic metre iron is } (7.5 \times 1000) \text{ kg}$$

$$\therefore \text{Weight of 0.3 cubic metre iron is}$$

$$\begin{aligned}&= (0.3 \times 7.5 \times 100) \text{ kg} \\ &= 2250 \text{ kg}\end{aligned}$$

∴ Weight of the iron sheet is 2250 kg. (Ans.)

c Given that

$$\text{Length of the blade of fan is 1 metre}$$

$$\text{Breadth " " " " " } 0.25 \text{ "}$$

$$\text{Thickness " " " " " } 0.01 \text{ "}$$

∴ Volume of the blade of fan is

$$\begin{aligned}&= (1 \times 0.25 \times 0.01) \text{ cubic metre} \\ &= 0.0025 \text{ cubic metre}\end{aligned}$$

Volume of the iron sheet is 0.3 cubic metre [From 'b']

Now,

Each fan has 3 blade

∴ Volume of blades of a fan

$$\begin{aligned}&= (3 \times 0.0025) \text{ cubic metre} \\ &= 0.0075 \text{ cubic metre}\end{aligned}$$

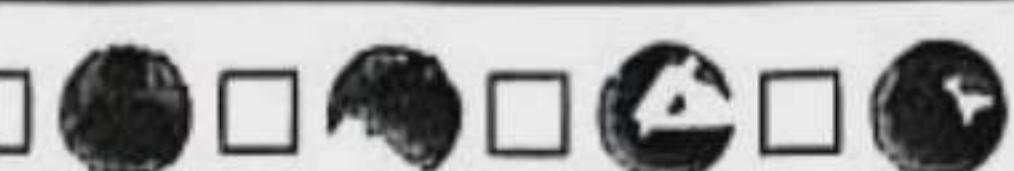
Number of fans can be made with that iron sheet

$$\begin{aligned}&= (0.3 \div 0.0075) \\ &= 40\end{aligned}$$

∴ 40 fans can be made with that iron sheet. (Ans.)

**Solutions to Textual Activities**

Along with textual reference



**Activity 01** Measure the length of your bench in inches and centimetres by a ruler. Determine from this, how many inches equal to 1 metre.

► Textbook Page 31

**Solution :** After measuring, Length  $\approx$  300 cm

Again, length = 118.11 inch

300 cm or 3 m = 118.11 inch

$$\therefore 1 \text{ m} = \frac{118.11}{3} \text{ inch} = 39.37 \text{ inch (approx)}$$

$$\therefore 1 \text{ m} = 39.37 \text{ inch (approx)}$$

**Activity 02** Determine from above relation, how many kilometres equal to a mile.

► Textbook Page 31

**Solution :** We know,

$$12 \text{ inc} = 1 \text{ ft}$$

$$\therefore 1 \text{ " } = \frac{1}{12} \text{ "}$$

$$\therefore 118.11 \text{ " } = \frac{1 \times 118.11}{12} \text{ ft} = 9.8425 \text{ ft}$$

Again, We know,

$$3 \text{ ft } = 1 \text{ yard}$$

$$\therefore 1 \text{ " } = \frac{1}{3} \text{ "}$$

$$\therefore 9.8425 \text{ " } = \frac{1 \times 9.8425}{3} = 3.2808 \text{ yard}$$

Again, We know,

$$1760 \text{ yard } = 1 \text{ mile}$$

$$\therefore 1 \text{ " } = \frac{1}{1760} \text{ "}$$

$$\therefore 3.2808 \text{ " } = \frac{1 \times 3.2808}{1760} \text{ mile } = 0.001864 \text{ mile}$$

$$\text{Now, } 0.001864 \text{ mile } = 3 \text{ m or } \frac{3}{1000} \text{ km}$$

$$\therefore 1 \text{ " } = \frac{3}{1000 \times 0.001864} \text{ "}$$

$$= 1.61 \text{ km (approx)}$$

$$\therefore 1 \text{ mile } = 1.61 \text{ km (approx).}$$

**Activity 03** Find the weight of your 5 books by the balance with a pointer. ► Textbook Page 32

**Solution :** Let's take 5 books. One by one, the books are placed on the marked balance and the weight is determined.

Weight of first book = 350 grams

Weight of second book = 200 grams

Weight of the third book = 280 grams

Weight of fourth book = 250 grams

Weight of fifth book = 290 grams.

**Activity 04** Find your weight by a digital balance.

► Textbook Page 32

**Solution :** Let us stand on the digital balance and the digital balance displays the weight.

My weight = 50 kg

Another friend stood on the digital balance and the machine displayed the wieght. My first friend's weight = 43 kg.

Similarly I determined the weight of my second friend.

My second friend's weight = 41 kg.

Therefore, my weight is 50 kg, my 1st friend's weight is 43 kg and my 2nd friend's weight is 41 kg as determined by digital balance.

**Activity 05** Measure the capacity of your water container in c.c and express it in cubic inches.

► Textbook Page 34

**Solution :** Capacity of my water container is 1 L.

We know, 1 L = 1000 mL

$$= (1000 \times 1) \text{ cu. cm } [\because 1 \text{ mL } = 1 \text{ cu. cm}]$$

$$= 1000 \text{ cc}$$

Again, 1 L = 1000 mL

$$= \frac{1000}{16.39} \text{ cu. inch } [\because 1 \text{ cu inch } = 16.39 \text{ mL (Approx)}]$$

$$= 61.0128 \text{ cu. inch}$$

$$= 61.013 \text{ cu. inch (approx)}$$

**Activity 06** Assume the volume of a pot of an unknown volume given by your teacher. Then find the exact volume and estimate the error.

► Textbook Page 34

**Solution :** Suppose the volume of the container given by the teacher is 1 litre. Now take a 250 ml container and fill it with water and pour it into the given container.

It was found that the container given to us was filled with water 5 times of the 250 ml container.

1 pot contains 250 mL

$$\therefore 5 \text{ " } = (5 \times 250) \text{ mL}$$

$$= 1250 \text{ mL}$$

∴ Correct volume 1250 mL

$$\therefore \text{Error } = (1250 - 1000) \text{ mL}$$

$$= 250 \text{ mL}$$

**Activity 07** Measure the length and the breadth of a book and table in inches and centimetres by a scale and find their areas in both units. From this find the relation between 1 sq. inch and 1 sq. centimetre.

► Textbook Page 36

**Solution :** Measured with a scale, the length of my book is 9.24 inches in inches, 23.47 cm in centimeters. The width of the book is 6.75 inches in inches, 17.15 cm in centimeters.

$$\therefore \text{Area of book in inches} = (9.24 \times 6.75) \text{ square inches} \\ = 62.37 \text{ square inches}$$

$$\therefore \text{Area of book in centimeters} = (23.47 \times 17.15) \text{ sq. cm} \\ = 402.51 \text{ sq. cm}$$

Since the area of the same book will be the same whichever way it is measured.

$$\therefore 62.37 \text{ sq. inch} = 402.51 \text{ sq. cm}$$

$$\text{or, } 1 \text{ sq. inch} = \frac{402.51}{62.37} \text{ sq. cm} = 6.45 \text{ sq. cm (approx)}$$

Again, measuring with a scale, the length of my table is 40 inches in inches and 101.6 cm in centimeters. And width is 30 inches in inches and 76.2 cm in centimeters.

$$\therefore \text{Area of table in A inch} = (40 \times 30) \text{ sq. inch} \\ = 1200 \text{ sq. inch}$$

$$\therefore \text{Area of table inc centimeters} = (101.6 \times 76.2) \text{ sq. cm} \\ = 7741.92 \text{ sq. cm}$$

Since, the area of the same table will be the same whichever way it is measured.

$$\therefore 7741.92 \text{ sq. cm} = 1200 \text{ sq. inch}$$

$$\text{or, } 1 \text{ sq. cm} = \frac{1200}{7741.92} \text{ sq. inch} = 0.155 \text{ sq. inch (approx.)}$$

**Activity 08** Measure the length and the breadth of a bench, table, door, window etc. in a group in inches and centimetres by scale and find their areas.

► Textbook Page 36

**Solution :** For bench, Length = 50 inch

Breadth = 20 inch

$$\therefore \text{Area} = (50 \times 20) \text{ sq. inch} = 1000 \text{ sq. inch}$$

For table, Length = 40 inch, Breadth = 30 inch

$$\therefore \text{Area} = (40 \times 30) \text{ sq. inch} = 1200 \text{ sq. inch}$$

For door, Length = 80 inch, Breadth = 30 inch

$$\therefore \text{Area} = (80 \times 30) \text{ sq. inch} = 2400 \text{ sq. inch}$$

For window, Length = 42 inch, Breadth = 20 inch

$$\therefore \text{Area} = (42 \times 20) \text{ sq. inch} = 840 \text{ sq. inch}$$

For bench, Length = 150.4 cm, Breadth = 45.74 cm

$$\therefore \text{Area} = (150.4 \times 45.74) \text{ sq. cm} \\ = 6879.296 \text{ sq. cm}$$

For table, Length = 100.68 cm, Breadth = 75.2 cm

$$\therefore \text{Area} = (100.68 \times 75.2) \text{ sq. cm} \\ = 7571.136 \text{ sq. cm}$$

For door, Length = 188.12 cm, Breadth = 76.2 cm

$$\therefore \text{Area} = (188.12 \times 76.2) \text{ sq. cm} \\ = 14334.74 \text{ sq. cm}$$

For window, Length = 105.68 cm, Breadth = 65.96 cm

$$\therefore \text{Area} = (105.68 \times 65.96) \text{ sq. cm} \\ = 6970.6528 \text{ sq. cm}$$



## Super Suggestions



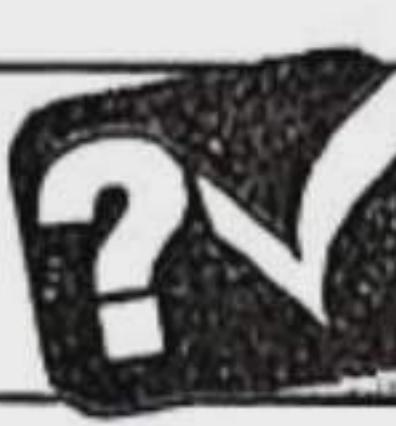
Super Suggestions with 100% preparatory questions selected by the Master Trainer Panel

Dear learners, important multiple choice, short and creative questions of this chapter selected by Master Trainer Panel for Half-Yearly and Annual Exams are presented below. Learn the answers to the mentioned questions well to ensure 100% preparation.

Question Pattern	7★	5★	3★
● MCQs with Answers	Learn each MCQs in this chapter thoroughly.		
● Short Q/A	4, 8, 12, 16, 20, 24, 31, 36	2, 9, 14, 22, 26, 32, 37	7, 13, 18, 23, 28, 34, 40
● Creative Q/A	3, 7, 12	1, 9, 13	6, 11



# Assessment & Evaluation



A question bank presented in the form  
of a class test to assess the preparation

## Class Test

Time : 3 hours

## Mathematics

Full marks : 100

### Class : Eight

#### Multiple Choice Questions (Each question carries 1 mark)

$1 \times 30 = 30$

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. What is the unit measurement for length?  
Ⓐ .1 unit Ⓑ 1 unit Ⓒ 10 unit Ⓓ 1000 unit
2. What is the meaning of 'Deci' in Greek language?  
Ⓐ hundredth Ⓑ tenth Ⓒ 10 times Ⓓ 100 times
3. The word 'One Tenth' comes from which language?  
Ⓐ Greek Ⓑ Latin Ⓒ Bangla Ⓓ English
4. One nautical mile = ?  
Ⓐ 4080 feet Ⓑ 5080 feet  
Ⓒ 6070 feet Ⓒ 6080 feet
5. 100000 metre = how many kilometre?  
Ⓐ 10 Ⓑ 100 Ⓒ 1000 Ⓓ 10000
6. How many inches is equal to 1 metre?  
Ⓐ 32.37 in Ⓑ 35.37 in Ⓒ 37.37 in Ⓓ 39.37 in
7. 1 acre = ?  
Ⓐ 4046.86 sq m Ⓑ 4064.86 sq m  
Ⓒ 4406.86 sq m Ⓒ 4640.86 sq m
8. 2 miles = how many yards?  
Ⓐ 6080 yards Ⓑ 5280 yards  
Ⓒ 3520 yards Ⓒ 1760 yards
9. How many kilometres is equal to one mile?  
Ⓐ 1.61 Ⓑ 1.16 Ⓒ 1.06 Ⓓ 0.62
10. 1 stator is equal to—.  
i. 13.08 cubic yards  
ii.  $1\text{ m}^3$   
iii. 35.3 cubic feet  
Which one is correct?  
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
11. The volume of a jug is 4.5 litre. How many jugs of water will be there in 900 litre?  
Ⓐ 100 Ⓑ 300 Ⓒ 200 Ⓓ 400
12. 1000 cubic centimetre = how many litre?  
Ⓐ 5 Ⓑ 3 Ⓒ 2 Ⓓ 1
13. How many kathas are there in 5 bighas?  
Ⓐ 20 Ⓑ 25 Ⓒ 50 Ⓓ 100
14. What is the length of the diagonal of a square with side 2 metre?  
Ⓐ  $\sqrt{2}$  m Ⓑ  $2\sqrt{2}$  m Ⓒ 4 m Ⓓ 8 m
15. If the area of a rectangular garden is  $714\text{ sq m}$  and its length is 34 metre. What is the perimeter of the garden?  
Ⓐ 55 metre Ⓑ 84 metre  
Ⓒ 110 metre Ⓒ 136 metre
16. The area of a rectangular garden is 400 sq. metre and length is 25 metre, then what is its perimeter?  
Ⓐ 25 m Ⓑ 41 m Ⓒ 82 m Ⓓ 100 m
17. If the base 1.5 m hight 80 cm then how much area in sq. metre of triangle?  
Ⓐ 0.6 Ⓑ 1.2 Ⓒ 60 Ⓓ 120
18. 2 Bigha = How many square yards?  
Ⓐ 720 Ⓑ 1440 Ⓒ 1600 Ⓓ 3200

■ Answer to the questions no. 19 and 20 based on the following information :

The length of a rectangular park is 40 metres and its breadth is 30 metres. There is a 2.5 metres wide road around outside.

19. What is the area of the park?  
Ⓐ 1200 are Ⓑ 12 are Ⓒ 1.2 are Ⓓ 0.12 are
20. What is the area of the road?  
Ⓐ 325 sq m Ⓑ 375 sq m  
Ⓒ 875 sq m Ⓒ 1575 sq m
21. What is the volume of a cube having the sides 3cm each?  
Ⓐ 27cc Ⓑ 18cc Ⓒ 9cc Ⓓ 6cc
22. The length of a side of a cubical tank is 5 metre. Which is the volume of the tank?  
Ⓐ 125 cubic metres Ⓑ 25 cubic metres  
Ⓒ 20 cubic metres Ⓒ 15 cubic metres
23. Which one of the following is the weight of gold bar?  
Ⓐ About 1 kg Ⓑ About 1.16 kg  
Ⓒ About 1.5 kg Ⓒ About 1.75 kg
- Answer the questions no. 24 and 25 in light of the following information :  
Gold is 19.3 times heavier than water. Length, breadth and height of a rectangular gold bar is 6 cm, 5 cm and 2 cm respectively.
24. Which one of the following is the volume of the gold bar?  
Ⓐ 40 cubic cm Ⓑ 60 cubic cm  
Ⓒ 80 cubic cm Ⓒ 100 cubic cm
25. Which one of the following is the weight of same volume of water of the gold bar?  
Ⓐ 60 gram Ⓑ 70 gram Ⓒ 80 gram Ⓓ 90 gram
26. In case of measurement and units—.  
i. 1 square yard = 9 square feet  
ii. 1 inch = 2.54 cm  
iii. 1 katha = 72 square yard  
Which one of the following is correct?  
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
27. The area of the square garden is 1600 sq metres. What is the length of the diagonal?  
Ⓐ 40 metres Ⓑ  $40\sqrt{2}$  metres  
Ⓒ 80 metres Ⓒ  $80\sqrt{2}$  metres
28. The area of a triangular land is 225 sq metres. If the height is 25 metres, which one is the base?  
Ⓐ 9 m Ⓑ 18 m Ⓒ 25 m Ⓓ 36 m
29. 1 cubic feet = how many litres (app.)  
Ⓐ 13.08 litres Ⓑ 28.67 litres  
Ⓒ 35.3 litres Ⓒ 4048 litres
30. How is a solid substance measured?  
Ⓐ By volume Ⓑ By weight  
Ⓒ By assumption Ⓒ None of the above

**Short-Answer Question** (Each question carries 2 marks)**Answer any 10 of the following questions :**

1. What do you mean by metre? Explain.
2. What is the meaning of deci, centi and milli in Latin?
3. The length of a bridge is 6 km and 241 metres. Express it in millimetres.
4. How many feet and how many yards are equal to 4 nautical miles?
5. A runner ran 25 rounds in a circular track of a length of 500 metres. How much distance did he run?
6. How many kilometres are there in 1.61 miles?
7. If 3 metric tons of rice is divided equally among 75 workers, how much rice will each get?
8. A tank is 5.5 metres long and 4 metres wide. The breadth of the tank is twice the height. How many litres of water will it contain?

 $2 \times 10 = 20$ 

9. 2 litres = how many millilitres?
10. If the perimeter of a square field is 20 yards, what is the area in square feet?
11. The rectangular garden has an area of 400 square metres and a breadth of 16 metres. What is the perimeter of the garden?
12. A university campus area is 275 acres. Express it in hectares with the nearest integer.
13. How many stones with an area of 2 square metres are required to cover a square floor of length 8 metres?
14. The area of a rectangle is 10 acres, and its length is 5 times its breadth. What is the breadth of the field?
15. A square has a side length of 200 m and there is a 3.5m wide road in the outside. What is the area of the road?

**Creative Question** (Each question carries 10 marks)**Answer any 5 of the following questions :**

1. The length of a rectangular gold bar is 9.2 mm, the breadth is 6.8 mm and the height is 3.5 mm. Again an empty reservoir of length 4.50 metres, breadth 2.50 metres and height 1.25 metres and the reservoir is filled with water,
  - a. The area of a square is 4 arc (square decametre). What is the length of the square? 2
  - b. Gold is 19.3 times heavier than water. What is the weight of the gold bar in Kg? 4
  - c. What is the weight of water in the reservoir in Kg? 4
2. The length of a rectangular garden is 50m. its breadth is 40 m. In the middle of the garden a pond is dug with 3m. depth whose bank is 3m. wide.
  - a. Determine how many metres in a yard. 2
  - b. Find out the weight of the water in the pond. 4
  - c. There is a 4 metres wide road around the outside of a square land which perimeter is equal to the rectangular garden. Find the area of the road. 4
3. The length of floor of a room is  $1\frac{1}{2}$  times of the width. The height of the room is 4 meters. Area of the floor is 150 sq. meters. An amount of Tk. 7500 is spent to cover the floor with 50 cm. square stone.
  - a. What is the width of the room in metres? 2
  - b. What is the price of each square stone? 4
  - c. What is the weight of water in kgs contained in a reservoir equal to the volume of the room? 4
4. The length of a garden is one and half times of its breadth and area is 2400 sq metres. There are two crosswise roads of width 2 metres just in the middle of the garden.
  - a. Express 15 metres and 75 centimetres in millimetres. 2
  - b. Determine the perimeter of the garden. 4
  - c. Determine the total area of the two roads. 4

 $10 \times 5 = 50$ 

5. The length of a pond is 54 metres and breadth is 36 metres and 50 centimeters. Its bank around inside is 2.5 metres wide and depth is 6 metres.
  - a. Find the perimeter of the pond. 2
  - b. Find out the area of the bank of the pond. 4
  - c. How much time is required to empty the pond, when 0.2 cubic metre water is emptied per minute by a machine? 4
5. The length and breadth of inner side of an open reservoir are 3.8 m and 1.25 m. The reservoir contains 9500 litres water. To put tile's sheet Tk 200 is spent for per sq metre.
  - a. Determine the length of the diagonal of the rectangle of length 16 metre and breadth 12 metre. 2
  - b. Find the depth of the reservoir. 4
  - c. How much money will be spent to put tile's sheet in the inner side of the reservoir? 4
7. The length of a rectangular region is three times of its breadth. Tk. 955.50 is spent to set the tiles in it at the rate of Tk. 6.50 per square metre. There is a 2 metres wide road around outside of that region.
  - a. If the breadth is 'a' metre of the rectangular region express its perimeter by 'a'. 2
  - b. Determine the length and breadth of the rectangular region. 4
  - c. Determine the area of the road. 4
8. Length, breadth and thickness of an iron sheet is 5 metre, 3 metre and 0.02 metre respectively. Blades of fan would be made by melting that iron sheet. Length, breadth and thickness of each blade of fan is 1 metre, 0.25 metre and 0.01 metre respectively. There are 3 blades in each fan. Iron is 7.5 metre heavier than water.
  - a. Determine the length of diagonal of a rectangle whose length is 16 metre and breadth is 12 metre. 2
  - b. Find the weight of iron sheet in kg. 4
  - c. How many fans can be made with that iron sheet? 4

**Answer Sheet ▶ Multiple Choice Questions**

1	Ⓐ	2	Ⓑ	3	Ⓓ	4	Ⓐ	5	Ⓓ	6	Ⓐ	7	Ⓐ	8	Ⓓ	9	Ⓐ	10	Ⓓ	11	Ⓓ	12	Ⓐ	13	Ⓐ	14	Ⓓ	15	Ⓓ
16	Ⓓ	17	Ⓐ	18	Ⓐ	19	Ⓓ	20	Ⓑ	21	Ⓐ	22	Ⓐ	23	Ⓓ	24	Ⓓ	25	Ⓐ	26	Ⓐ	27	Ⓓ	28	Ⓓ	29	Ⓓ	30	Ⓓ

**Solving Reference ▶ Short-Answer Questions**

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|---------------------------|---------------------------|----------------------------|----------------------------|
| 1 ▶ See Page 73; Ques. 02 | 5 ▶ See Page 74; Ques. 09 | 9 ▶ See Page 75; Ques. 16  | 13 ▶ See Page 76; Ques. 25 |
| 2 ▶ See Page 73; Ques. 04 | 6 ▶ See Page 74; Ques. 11 | 10 ▶ See Page 75; Ques. 18 | 14 ▶ See Page 76; Ques. 27 |
| 3 ▶ See Page 73; Ques. 06 | 7 ▶ See Page 74; Ques. 13 | 11 ▶ See Page 75; Ques. 20 | 15 ▶ See Page 76; Ques. 29 |
| 4 ▶ See Page 74; Ques. 07 | 8 ▶ See Page 74; Ques. 14 | 12 ▶ See Page 76; Ques. 23 |                            |

**Solving Reference ▶ Creative Questions**

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|---------------------------|---------------------------|---------------------------|---------------------------|
| 1 ▶ See Page 78; Ques. 02 | 3 ▶ See Page 81; Ques. 07 | 5 ▶ See Page 83; Ques. 12 | 7 ▶ See Page 84; Ques. 13 |
| 2 ▶ See Page 80; Ques. 04 | 4 ▶ See Page 82; Ques. 10 | 6 ▶ See Page 83; Ques. 11 | 8 ▶ See Page 84; Ques. 14 |