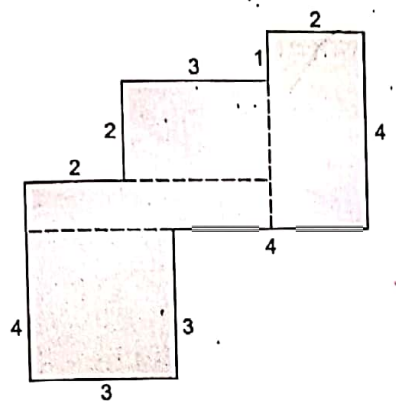
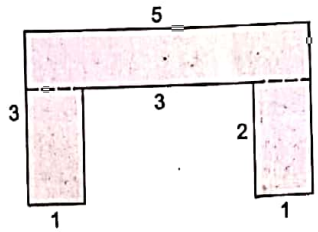
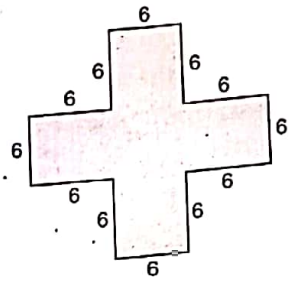
17. Calculate the area of each one of the shaded regions given below (all measures are given in cm):



(i)



(ii)



(iii)

EXERCISE 21E

OBJECTIVE QUESTIONS

Mark (✓) against the correct answer in each of the following:

1. The sides of a rectangle are in the ratio 7 : 5 and its perimeter is 96 cm. The length of the rectangle is
   (a) 21 cm (b) 28 cm (c) 35 cm (d) 14 cm

2. The area of a rectangle is 650 cm^2 and its breadth is 13 cm. The perimeter of the rectangle is
   (a) 63 cm (b) 130 cm (c) 100 cm (d) 126 cm

3. The cost of fencing a rectangular field 34 m long and 18 m wide at ₹ 22.50 per metre is
   (a) ₹ 2430 (b) ₹ 2340 (c) ₹ 2400 (d) ₹ 3340

4. The cost of fencing a rectangular field at ₹ 30 per metre is ₹ 2400. If the length of the field is 24 m, then its breadth is
   (a) 8 m (b) 16 m (c) 18 m (d) 24 m

5. The area of a rectangular carpet is 120 m^2 and its perimeter is 46 m. The length of its diagonal is
   (a) 15 m (b) 16 m (c) 17 m (d) 20 m

   Hint. $l + b = 23$ *and* $lb = 120$.
   $(l^2 + b^2) = (l+b)^2 - 2lb = (23)^2 - 2 \times 120 = 289$.
   Diagonal $= \sqrt{l^2 + b^2} = \sqrt{289} = \sqrt{17 \times 17} = 17$.

6. The length of a rectangle is three times its width and the length of its diagonal is $6\sqrt{10}$ cm. The perimeter of the rectangle is
   (a) 48 cm (b) 36 cm (c) 24 cm (d) $24\sqrt{10}$ cm

7. If the ratio between the length and perimeter of a rectangular plot is 1 : 3, then the ratio between the length and breadth of the plot is
   (a) 1 : 2 (b) 2 : 1 (c) 3 : 2 (d) 2 : 3

Hint. *Let the length be x cm. Then, its perimeter is 3x cm.*

$\therefore\ 2(x+b) = 3x \Rightarrow 2b = (3x-2x) = x \Rightarrow b = \frac{x}{2}$.

$\therefore\ l : b = x : \frac{x}{2} = 2x : x = 2 : 1.$

8. The length of the diagonal of a square is 20 cm. Its area is
(a) 400 cm^2 (b) 200 cm^2 (c) 300 cm^2 (d) $100\sqrt{2}$ cm^2

9. The cost of putting a fence around a square field at ₹ 25 per metre is ₹ 2000. The length of each side of the field is
(a) 80 m (b) 40 m (c) 20 m (d) none of these

10. The diameter of a circle is 7 cm. Its circumference is
(a) 44 cm (b) 22 cm (c) 28 cm (d) 14 cm

11. The circumference of a circle is 88 cm. Its diameter is
(a) 28 cm (b) 42 cm (c) 56 cm (d) none of these

12. The diameter of a wheel of a car is 70 cm. How much distance will it cover in making 50 revolutions?
(a) 350 m (b) 110 m (c) 165 m (d) 220 m

13. A lane 150 m long and 9 m wide is to be paved with bricks, each measuring 22.5 cm by 7.5 cm. How many bricks are required?
(a) 65000 (b) 70000 (c) 75000 (d) 80000

14. A room is 5 m 40 cm long and 4 m 50 cm broad. Its area is
(a) 23.4 m^2 (b) 24.3 m^2 (c) 25 m^2 (d) 98.01 m^2

15. How many envelopes can be made out of a sheet of paper 72 cm by 48 cm, if each envelope requires a paper of size 18 cm by 12 cm?
(a) 4 (b) 8 (c) 12 (d) 16

Things to Remember

I. *Perimeter:*

1. *The sum of the lengths of all sides of a plane figure, or the length of its boundary, is called the perimeter of the figure.*
2. *Perimeter of a rectangle = 2 (l + b) units, where l is its length and b is its breadth.*
3. *Perimeter of a square = (4a) units, where a is one of its four sides.*
4. *Perimeter of a circle is called its circumference. If the radius of a circle is r, then its perimeter (circumference) = $2\pi r$ units.*

II. *Area:*

1. *The measurement of the region enclosed by a plane figure is called the area of the figure.*
2. *Area of a rectangle = (length × breadth) sq units.*
3. *Area of a square = $(side)^2$ sq units = $\left\{\frac{1}{2} \times (diagonal)^2\right\}$ sq units.*

TEST PAPER-21

A. 1. Find the perimeter of the following shapes:

(i) a triangle whose sides are 5.4 cm, 4.6 cm and 6.8 cm

(ii) a regular hexagon of side 8 cm

(iii) an isosceles triangle with equal sides 6 cm each and third side 4.5 cm.

2. The perimeter of a rectangular field is 360 m and its breadth is 75 m. Find its length.

3. The length and breadth of a rectangular field are in the ratio 5 : 4. If its perimeter is 108 m, find the dimensions of the field.

4. Find the area of a square whose perimeter is 84 cm.

5. The area of a room is 216 m^2 and its breadth is 12 m. Find the length of the room.

6. Find the circumference of a circle of radius 7 cm. [Take $\pi = \frac{22}{7}$]

7. The diameter of a wheel of a car is 77 cm. Find the distance covered by the wheel in 500 revolutions.

8. Find the diameter of a wheel whose circumference is 176 cm.

9. Find the area of a rectangle whose length is 36 cm and breadth 15 cm.

B. *Mark (✓) against the correct answer in each of the following:*

10. Perimeter of a square of side 16 cm is

(a) 256 cm (b) 64 cm (c) 32 cm (d) 48 cm

11. The area of a rectangle is 240 m^2 and its length is 16 m. Then, its breadth is

(a) 15 m (b) 16 m (c) 30 m (d) 40 m

12. The area of a square lawn of side 15 m is

(a) 60 m^2 (b) 225 m^2 (c) 45 m^2 (d) 120 m^2

13. The area of a square is 256 cm^2. The perimeter of the square is

(a) 16 cm (b) 32 cm (c) 48 cm (d) 64 cm

14. The area of a rectangle is 126 m^2 and its length is 12 m. The breadth of the rectangle is

(a) 10 m (b) 10.5 m (c) 11 m (d) 11.5 m

C. 15. *Fill in the blanks.*

(i) A polygon having all sides equal and all angles equal is called a ..... polygon.

(ii) Perimeter of a square = ... × side.

(iii) Area of a rectangle = (.....) × (.....).

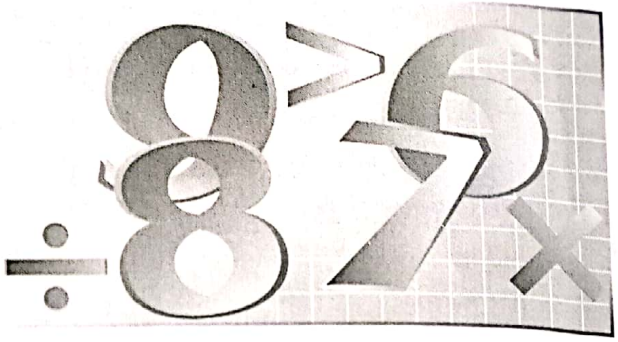
(iv) Area of a square = ...

(v) If the length of a rectangle is 5 m and its breadth is 4 m, then its area is ..... .

D. 16. *Match the following:*

(a) Area of a rectangle	(i) πr^2
(b) Area of a square	(ii) 4 × side
(c) Perimeter of a rectangle	(iii) $l \times b$
(d) Perimeter of a square	(iv) $(\text{side})^2$
(e) Area of a circle	(v) $2(l + b)$

22 Data Handling



DATA *The word data means information in the form of numerical figures.*

EXAMPLE 1. *The marks obtained by* 10 *pupils of a class in a monthly test are given below:*

37, 21, 43, 16, 25, 21, 28, 32, 45, 14.

We call it the data related to the marks obtained by 10 *pupils of a class in a monthly test.*

EXAMPLE 2. *The ages (in years) of* 12 *teachers in a school are:*

35, 43, 38, 45, 32, 54, 39, 43, 39, 54, 24, 31.

We call it the data related to the ages of 12 *teachers in a school.*

RAW DATA *Data obtained in the original form is called raw data.*

Data given in the above examples are raw data.

ARRAY *Arranging the numerical figures in an ascending or a descending order is called an array.*

TABULATION OF DATA *Arranging the data in a systematic form in the form of a table is called tabulation or presentation of the data.*

OBSERVATIONS *Each numerical figure in a data is called an observation.*

FREQUENCY OF AN OBSERVATION *The number of times a particular observation occurs is called its frequency.*

STATISTICS *It is the science which deals with the collection, presentation, analysis and interpretation of numerical data.*

ILLUSTRATIVE EXAMPLES

EXAMPLE 1. *Given below is the data showing the number of children in* 20 *families of a colony:*

2, 1, 3, 1, 2, 1, 1, 3, 2, 3, 2, 3, 2, 2, 4, 3, 1, 4, 3, 2.

Arrange the above data in an ascending order and then put it in the tabular form.

Solution Arranging the data in an ascending order, we get the given data as

1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 4, 4.

For counting purposes, we use tally marks. After putting 4 tally marks vertically, we put a cross as shown below and again we take the tally marks in the same manner, counting in sets of fives.

Now, we may prepare the frequency table, as shown below.

Observation	Tally marks	No. of families (Frequency)
1	𝍸	5
2	𝍸 ||	7
3	𝍸 |	6
4	||	2

EXAMPLE 2. *A dice was thrown 30 times and the following outcomes were noted:*
4, 3, 3, 2, 5, 4, 4, 6, 1, 2, 2, 3, 4, 6, 2, 3, 3, 4, 1, 2, 3, 3, 4, 5, 6, 3, 2, 1, 3, 4.
Represent the above data in the form of frequency distribution.

Solution We may present the data, as shown below:

Outcome	Tally marks	No. of outcomes
1	|||	3
2	𝍸 |	6
3	𝍸 ||||	9
4	𝍸 ||	7
5	||	2
6	|||	3

EXERCISE 22

1. Define the terms:
   (i) Data (ii) Raw data (iii) Array
   (iv) Tabulation of data (v) Observations
   (vi) Frequency of an observation (vii) Statistics
2. The number of children in 25 families of a colony are given below:
   2, 0, 2, 4, 2, 1, 3, 3, 1, 0, 2, 3, 4, 3, 1, 1, 1, 2, 2, 3, 2, 4, 1, 2, 2.
   Represent the above data in the form of a frequency distribution table.
3. The sale of shoes of various sizes at a shop on a particular day is given below:
   6, 9, 8, 5, 5, 4, 9, 8, 5, 6, 9, 9, 7, 8, 9, 7, 6, 9, 8, 6, 7, 5, 8, 9, 4, 5, 8, 7.
   Represent the above data in the form of a frequency distribution table.
4. Construct a frequency table for the following:
   3, 2, 5, 4, 1, 3, 2, 2, 5, 3, 1, 2, 1, 1, 2, 2, 3, 4, 5, 3, 1, 2, 3.
5. Construct a frequency table for the following:
   7, 8, 6, 5, 6, 7, 7, 9, 8, 10, 7, 6, 7, 8, 8, 9, 10, 5, 7, 8, 7, 6.
6. Fill in the blanks:
   (i) Data means information in the form of ..... .
   (ii) Data obtained in the ..... form is called raw data.
   (iii) Arranging the numerical figures in an ascending or a descending order is called an ..... .
   (iv) The number of times a particular observation occurs is called its ..... .
   (v) Arranging the data in the form of a table is called ..... .