Data Handling

You are familiar with the pictorial representation of data. In previous class, you have studied how to collect information (data) and represent it pictorially.

The emphasis is given on systematic recording of data and students are expected to represent the collected information (data) either through a table or pictorially. In pictorial representation, the particular type of picture symbols should be used to represent a chosen number. For example, the symbol of [image] may be used to show the presentations of students.

Collection and Recording of Data

Any information collected in the form of data and represented through picture symbols is known as pictograph.

For example, to prepare pictograph for the number bicycles produced by a factory on the first four days of a week. An investigator visited the factory and collected the information about the number of bicycles produce on each of these days.

The investigator recorded the information in the form of a table as follows :

Days	Monday	Tuesday	Wednesday	Thursday
No. of bicycles produced	400	300	250	350

The information represented in the form of a table given above is known as recording or tabulating of data. The recorded data can be represented through picture symbols as shown below :

Monday	
Tuesday	
Wednesday	
Thursday	

Scale : One [image] represents 50 bicycles.

The day-wise information represented through picture symbol of the bicycles is known as pictograph.

Representation of this form of information makes easy to answer different type of questions related to the data.

a. On which day the maximum number of bicycles are produced?

On Monday the maximum number of bicycles are produced, i.e. 400.

b. On which day the minimum number of bicycles are produced?

On Wednesday the minimum number of bicycles are produced, i.e. 250.

c. How many more bicycles are produced on Thursday than Tuesday?

50 more bicycles are produced on Thursday than Tuesday.

d. Find the total number of bicycles produced in four days of week from (Monday to Thursday)?

Total number of bicycles produced from Monday to Thursday

= 400 + 300 + 250 + 350 = 1300.

Therefore, total number of bicycles produced in four days of week are 1300.

Facts to Know

○ **The information in the form of numerical figures which is used to find out things and to make decisions is called data.**

Exercise 15.1

1. **A car company's produced the following model of cars in 4 weeks. Carefully read the pictograph and answer the given questions below.**

1st Month	🚗 🚗 🚗 🚗 🚗
2nd Month	🚗 🚗 🚗 🚗
3rd Month	🚗 🚗 🚗 🚗 🚗 🚗 🚗
4th Month	🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗 🚗

Scale : One 🚗 represents 20 cars.

a. In which month the maximum number of cars were made write in figure ?

b. In which month the minimum number of cars were made write in figure ?

c. Find the total number of cars made during the last 4 month write in figure ?

2. A school library has different books as shown in the given pictograph.

Arts & Literature	📗 📗 📗 📗 📗 📗 📗
Science & Fictions	📗 📗 📗 📗 📗 📗 📗 📗 📗 📗
Gen Studies	📗 📗 📗 📗 📗
Maths	📗 📗 📗 📗 📗 📗 📗
Others	📗 📗 📗
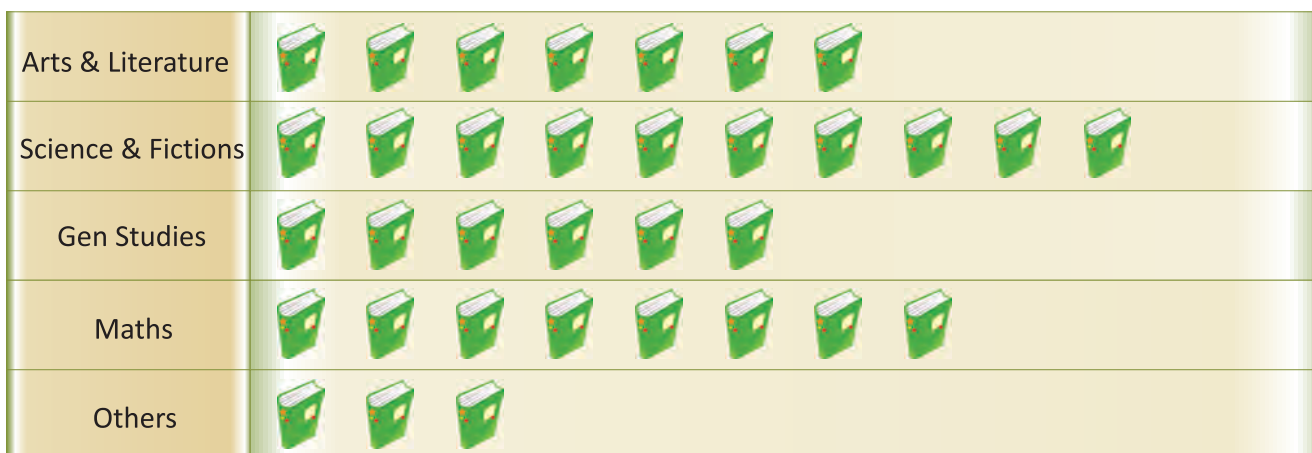
Scale : One 📗 represents 100 books.

Answer the following questions.

a. Which subject books are maximum in number?

b. Which subject books are minimum in number?

c. How many Science books are there in the library?

d. What is the total number of books in the library?

Tally Chart

A tally chart is a quick and easy way to count how many items are there in each category. We represent each item as a vertical stroke | and every fifth observation is represented by crossing the four strokes diagonally ||||.

Frequency

If an observation occurs 6 times in a data, then its frequency is 6.

The number of times, a particular observation occurs in a data, is known as frequency.

For Example : Zeny takes a survey of her classmates to find out their favourite ice-cream flavour. She records the choice of each student by using tally marks.

Chocolate, Mango, Strawberry, Mango, Chocolate, Vanilla, Mango, Chocolate, Vanilla, Mango, Chocolate, Mango, Strawberry, Chocolate, Mango, Vanilla, Chocolate, Mango, Vanilla, Strawberry, Mango, Chocolate, Vanilla, Strawberry, Chocolate, Vanilla, Strawberry, Chocolate, Mango, Strawberry, Vanilla, Strawberry, Chocolate, Vanilla, Strawberry, Mango, Chocolate, Mango, Vanilla, Strawberry, Vanilla, Chocolate, Strawberry, Mango, Strawberry, Vanilla, Chocolate, Strawberry, Chocolate, Mango, Chocolate, Strawberry, Vanilla, Chocolate, Strawberry, Chocolate, Strawberry, Mango, Chocolate, Chocolate, Strawberry, Mango, Chocolate, Mango, Strawberry, Mango, Strawberry, Chocolate, Chocolate, Mango, Strawberry, Mango, Chocolate, Strawberry, Chocolate, Mango.

Ice-cream flavour	Tally marks	Frequency
Strawberry	ℍℍ ℍℍ ℍℍ ℍℍ	20
Vanilla	ℍℍ ℍℍ ‖	12
Chocolate	ℍℍ ℍℍ ℍℍ ℍℍ ‖‖‖	24
Mango	ℍℍ ℍℍ ℍℍ ℍℍ	20

From the tally chart, we can conclude the following :

1. 20 students like strawberry flavour.
2. 12 students like vanilla flavour.
3. 24 students like chocolate flavour.
4. 20 students like mango flavour.
5. Chocolate is the most popular flavour among the students.
6. Vanilla is the least popular flavour among the students.
7. Mango and strawberry flavours are equally liked by 20 students.

We can also represent the information with the help of a pictograph.

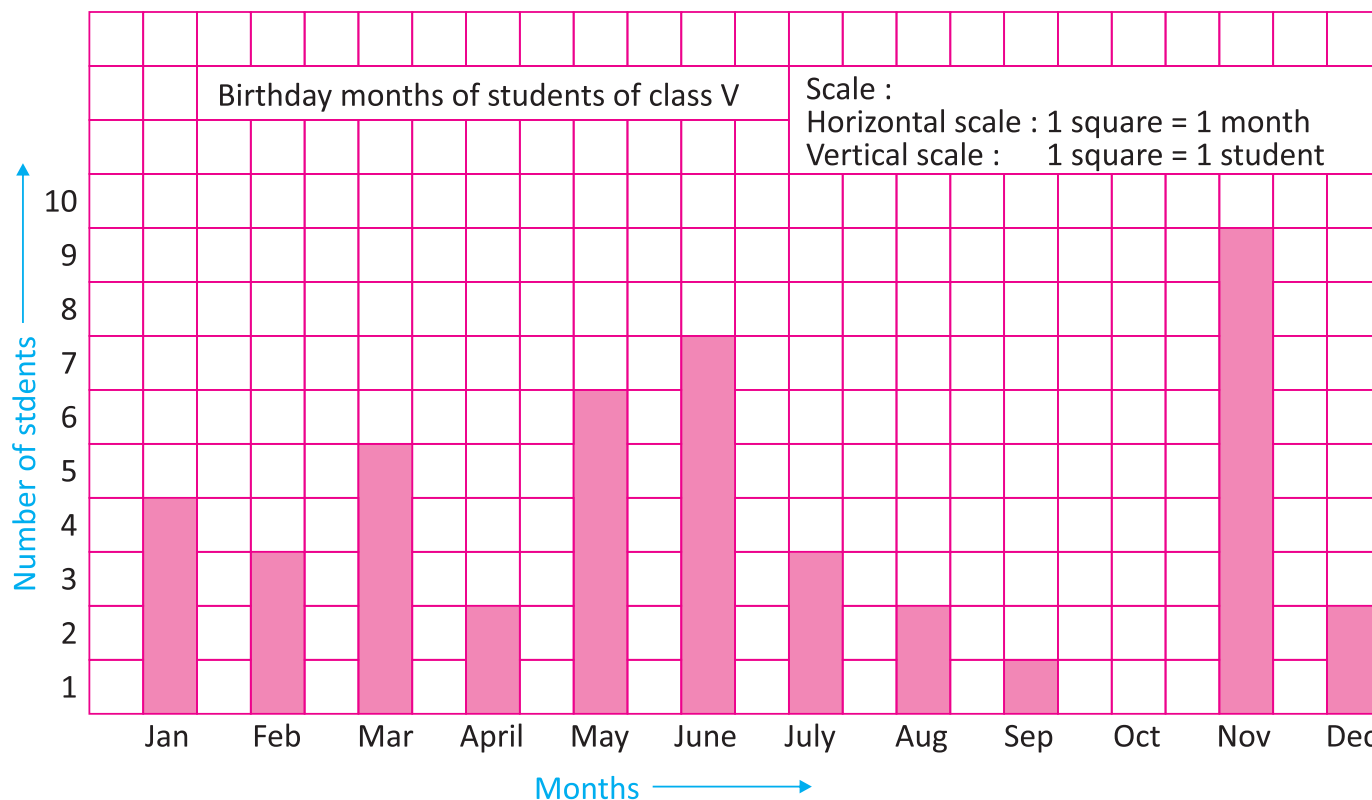| Favourite ice-cream flavour	Scale : 👧 → 4 students
Strawberry	👧 👧 👧 👧 👧
Vanilla	👧 👧 👧
Chocolate	👧 👧 👧 👧 👧 👧
Mango	👧 👧 👧 👧 👧

Bar Graphs

One of the most common and effective way of representing data is by means of a bar graph.

A bar graph represents numerical data by a number of rectangular bars of equal width. The length of the bar graph represents the frequency. Bar graphs can be horizontal or vertical. Every bar graph must have the following features.

1. Title of the bar graph
2. The horizontal and vertical scales used
3. The labelling of the scales

Look at the bar graph shown below.

Birthday months of students of class V

Scale :
Horizontal scale : 1 square = 1 month
Vertical scale :   1 square = 1 student

The bar graph represents the birthday months of the students of class V.

The months have been shown along the horizontal axis and the number of students along the vertical axis.

The scales used are :

Horizontal scale : 1 square = 1 month

Vertical scale   : 1 square = 1 student

We can answer the following questions by reading the bar graph :

1.   The total number of students in class V = 44

2.   The month which has the most birthdays : November

3.   The month which has no birthday : October

4.   Which months have the same number of birthday?

        April, August and December

Circle Graphs

Circle graph also called pie chart, is a type of graph used to represent a part of a whole relationship. They are used to compare different parts of a whole amount.

1.   They are circular shaped graphs with the entire circle representing the whole.

2.   The circle is then split into parts or sections.

3.   Each part/section is proportional in size to the amount each part/section represents, therefore it is easy to make comparisons.

For Example :   The table shows the choice of restaurants for 40 students of class V. Represent the same information on a circular graph.

Restaurant	Number of students
McDonald's	20
Pizza hut	5
Dominos	5
Haldiram's	10

McDonald's : 20 out of 40
$= \dfrac{1}{2}$ of the total
i.e. half of the circle is marked as McDonald's.

Haldiram's : 10 out of 40
$= \dfrac{1}{4}$ of the total
i.e. quarter of the circle is marked as Haldiram's.

Pizza Hut : 5 out of 40
$= \dfrac{1}{8}$ of the total
i.e. $\dfrac{1}{8}$ of the circle is marked as Pizza Hut.

Dominos : 5 out of 40
$= \dfrac{1}{8}$ of the total
i.e. $\dfrac{1}{8}$ of the circle is marked as Dominos.
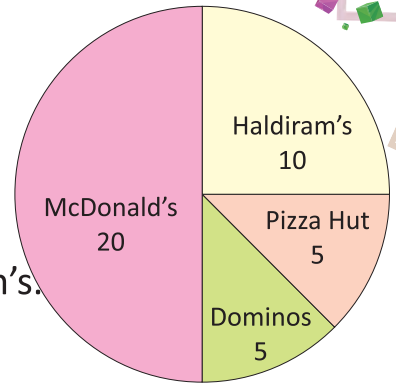
Exercise 15.2

1. Complete the following tally chart.

Fruit	Tally marks	Frequency
Peach	‖‖ ‖‖ ‖‖ ‖‖ |||	
Guava		21
Black berrys	‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ||	
Pine apple	‖‖ ‖‖ ‖‖		
Coconut		27

2. The bar graph given below shows the favourite breakfast items of the students of class V. Read the bar graph and answer the questions that follow.
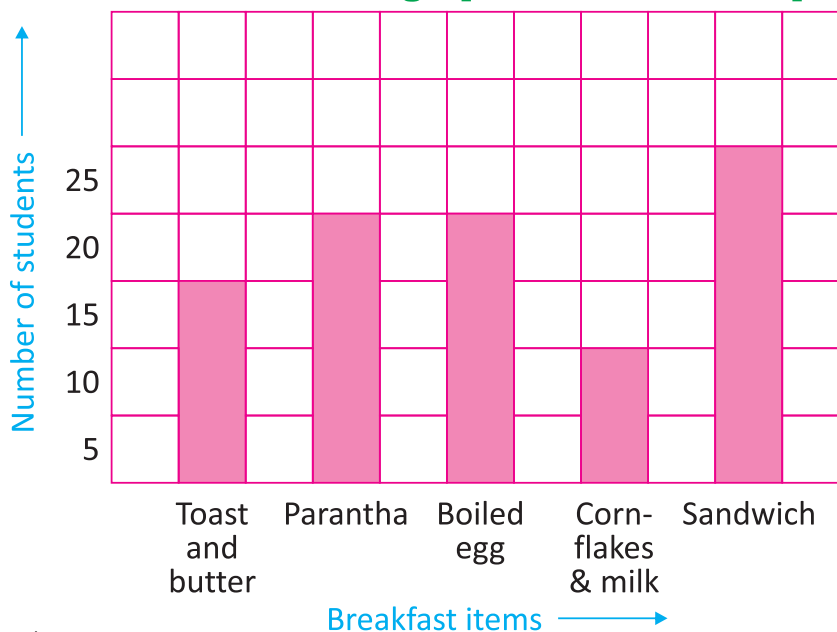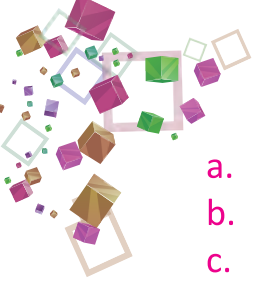
a. Which is the favourite breakfast item?
b. Which is the least popular breakfast item?
c. How many students like toast and butter?
d. Which two breakfast items are equally liked by the students?
e. How many students gave their choices?

3. **The students of class V gave the following choices about their favourite dresses. Prepare a tally chart and represent the information with the help of both pictograph and bar graph.**

Jeans, T-shirt, Jacket, Bermuda, Sweater, Sweater, T-shirt, Jeans, Sweater, Jacket, T-shirt, T-shirt, Sweater, Jacket, T-shirt, Bermuda, Sweater, Bermuda, T-shirt, Sweater, Jacket, Sweater, Jacket, T-shirt, Bermuda, T-shirt, Sweater, Bermuda, Jacket, T-shirt, T-shirt, Bermuda, Jacket, Jacket, Jacket, Jacket, T-shirt, Jacket, Bermuda, Jeans, Jacket, T-shirt, Bermuda, Jeans, Jacket, Jeans, Sweater

4. In a group of 60 boys, 20 are wearing green shirt, 10 white shirt, 10 blue shirt, 15 black shirt and 5 red shirt. Represent this information on a bar graph.

5. The number of spectators for a circus show for a given week is shown below.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Number of people	3500	4000	4500	5000	4000	5000	5500

Represent this information on a bar graph.

6. 100 boys were asked which kind of sports they like to watch. Look at the table that give their replies and label the given circular graph.

Sport	Number of boys
Cricket	65
Football	25
Hockey	10
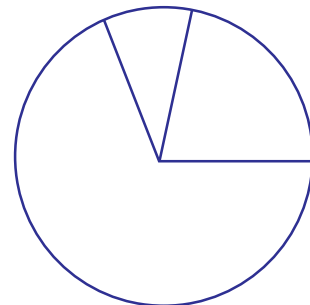
Points to Remember

- ❖ Any information is collected in the form of data and represented through picture symbols is known as a pictograph.
- ❖ Before collecting data, we need to know what we would use it for.
- ❖ For organising data, tally marks can be very useful.
- ❖ Collected data can be represented with the help of a pictograph, a bar graph or a circle graph.
- ❖ Circle graphs are also called pie charts, are a type of graph used to represent a part of a whole relationship.

1. **Multiple Choice Questions (MCQs)**
    Tick (✓) the correct option:

    a. Data collected can be represented in the form of ....
        (i)   pictograph ☐   (ii)   bar graph ☐
        (iii) circle graph ☐   (iv)   all of these ☐

    b. A .... represents numerical data by a number of rectangular bars of equal width.
        (i)   pictograph ☐   (ii)   circle graph ☐
        (iii) bar graph ☐   (iv)   tally chart ☐

    c. Every bar graph must have ....
        (i)   title ☐   (ii)   horizontal scale ☐
        (iii) vertical scale ☐   (iv) all of these ☐

    d. Circle graph also called ....
        (i)   pictograph ☐   (ii) bar graph ☐
        (iii) pie chart ☐   (v)   none of these ☐

    e. To make a circle graph we use ....
        (i)   circle ☐   (ii) rectangular bars ☐
        (iii) symbols ☐   (iv) none of these ☐

2. **Shaily opened her saving account in bank and a deposited of rupees of 100 paise, 150 rupee, 50 rupee and 120 rupee after. She quickly made a tally chart to show the amount which was in her money in bank. Complete the tally chart and answer the questions that follow.**

Rupees	Tally marks	Frequency
100 Rs	||||| (20 times)	
150 Rs	||||| (30 times)	
50 Rs	||||| (10 times)	
120 Rs	||||| (24 times)	

Do it yourself

a. Which notes are there minimum in number?
b. Which notes are there in the largest number?
c. Write all notes denominations frequency .

3. **The temperature recorded for seven days in a city is as follows :**

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature	37°C	35°C	39°C	40°C	38°C	40°C	42°C

Prepare a bar graph and answer the following questions.
a. Which was the hottest day?
b. What is the difference between the highest and the lowest temperature?
c. What was the temperature on Tuesday?
d. Which two days were equally hot?

4. **The pictograph shows the number of flowers plucked by Reena, Gunjan and Anita.**

Name	Scale : 🌹→2 flowers
Reena	🌹 🌹 🌹 🌹 🌹 🌹 🌹
Gunjan	🌹 🌹 🌹 🌹 🌹 🌹
Anita	🌹 🌹 🌹 🌹 🌹 🌹 🌹 🌹 🌹 🌹

Answer the following questions.
a. Who among the three, plucked the least number of flowers?
b. Who among the three, plucked the maximum number of flowers?
c. How many flowers were plucked in all?

5. **The bar graph shows the favourite fast food of some students of a locality.**

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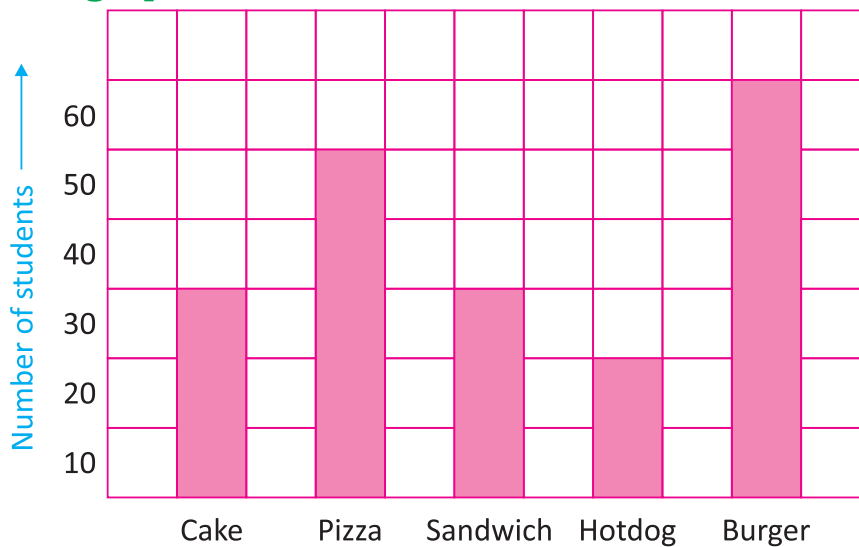
Based on the above information answer the following.

a. Which is the most favourite fast food?
b. Which fast food is liked by minimum number of students?
c. How many students like cake?
d. How many students gave their choices?
e. Which two fast foods are equally liked by the students?

HOTS

Which type of graph is better for showing increasing numbers?

Lab Activity

Objective : To understand the concept of data collection.

Materials Required : Chart paper, white paper, crayons and glue

Activities :

❖ Prepare a bar graph to represent the hobbies on the square lined paper as shown. All the students of the class will take part.

❖ Each student takes a piece of paper approximately the size of the grid.

❖ The students write their names on the paper.

❖ The students observe the chart and stick their names on the grid according to their hobbies.

❖ After the entire class has completed its turn, each student is asked to answer the questions given below with the help of the bar graph.

Hobbies of students

| | Reading story book | Playing games | Dancing | Singing | Painting |

Number of students — 1 to 10

Hobbies →

a. Number of children in the class ....
b. Number of children having the same hobby as yours ....
c. The activity least loved by the students ....
d. Most popular hobby ....
e. Any two hobbies that have the same number of students ....
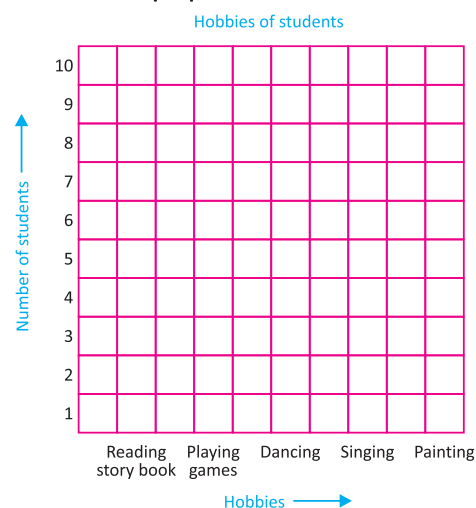
The teacher can ask other related questions.

A. **Multiple Choice Questions (MCQs)**
Tick (✓) the correct option:

1. If the cost of 12 apples is ₹ 24, the cost of one apple is ....
   (a) ₹ 2 ☐ (b) ₹ 3 ☐ (c) ₹ 4 ☐ (d) ₹ 5 ☐

2. If S.P. is ₹ 6400 and C.P. is ₹ 5600, then there is a ....
   (a) profit ☐ (b) loss ☐ (c) bargain ☐ (d) none of these ☐

3. The amount for which an article is bought is called ....
   (a) profit ☐ (b) cost price ☐
   (c) selling price ☐ (d) none of these ☐

4. If C.P. is ₹ 600 and loss is ₹ 104, then S.P. is ....
   (a) 406 ☐ (b) 486 ☐ (c) 476 ☐ (d) 496 ☐

5. To reflect an object means to produce its .... image.
   (a) mirror ☐ (b) different ☐ (c) outline ☐ (d) none of these ☐

6. The number of times an observation occurs is called ....
   (a) data ☐ (b) tally ☐
   (c) frequency ☐ (d) none of these ☐

7. The rectangular columns in a bar graph are called ....
   (a) tally ☐ (b) bars ☐ (c) data ☐ (d) none of these ☐

8. Every bar graph must have ....
   (a) title ☐ (b) horizontal scale ☐
   (c) vertical scale ☐ (d) all of these ☐

9. Circle graph also called ....
   (a) pictograph ☐ (b) bar graph ☐
   (c) pie chart ☐ (d) none of these ☐

10. To make a circle graph we use ....
    (a) circle ☐ (b) rectangular bars ☐
    (c) symbols ☐ (d) none of these ☐

B. **Match the columns:**

Column A		Column B
1. Profit	I.	410
2. Letter J	II.	pie chart
3. circle graph	III.	SP − CP
4. 10, 110, 210, 310	IV.	CP + profit
5. selling price	V.	no axis of symmetry

MODEL TEST PAPER-II

(Based on Chapters 9 to 15)

A. Fill in the blanks.

1.   We can also multiply and divide the numbers by conversion of ....

2.   Perimeter is the distance around a ....

3.   All .... should have the same unit for calculation.

4.   The volume of a 1 cm cube is ....

5.   The amount of space occupied by a solid is known as ....

6.   .... scale is also called centigrade scale and is marked from 0° to 100°.

7.   Doctors use .... thermometer.

8.   To find profit or loss, we need to know the C.P. and ....

9.   The line which divides a figure into two identical halves, is called the axis of ....

10. Collected data can be represented with the help of a pictograph, a bar graph or a ....

B. Tick (✓) the true and cross (✗) the false statements:

1.   We can not multiply and divide the numbers by conversion of units.

2.   Perimeter of a rectangle = 2 (length + breadth)

3.   The amount of a space occupied by a solid is called its volume.

4.   The thermometer is an instrument used to measure time.

5.   Profit = CP – SP and loss = SP – CP

6.   Reflection shows the image of an object corresponding in appearance.

7.   For organising data, tally marks can not be very useful.

8.   Basic measure of length is metre.

9.   A square is an open figure.

10. Sides of a square are equal.
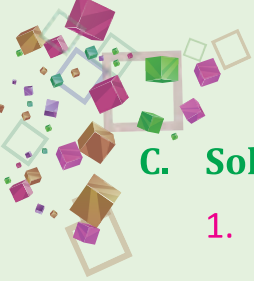
C. Solve.

1. Find the sum.

    (a) 7 h 30 min + 6 h 20 min   (b) 5 years 11 months + 3 years 10 months

2. Write the first five multiples of 12 and discover the pattern.

3. Convert the following :

    (a) 8 Kg into g   (b) 5000 m into Km.

4. Find the product :

    (a) 35 m 15 cm by 5   (b) 20 Kg 200 g by 2

5. Find the area of a square whose side is :

    (a) 8 cm   (b) 9 cm   (c) 12 cm

6. Find the volume of the cube whose lengths are

    (a) 5 cm   (b) 3 cm   (d) 6 cm

D. Solve the following.

1. Sunil was in Allahabad for 3 years 10 months. He was in Kanpur for 3 years 2 months. How much longer was Sunil in Allahabad?

2. A sick person having 110° F temperature took some medicine to control fever. After some time, he realised the temperature dropped by 3°C. What is his temperature in °C?

3. Pappu bought a bag of sugar for ₹ 1520 and sold it for ₹ 30 loss. What was the selling price of the bag of sugar?

4. Write the letters D, P, M, Y and Z and read their images through a mirror. What does each letter look like?

5. In a group of 60 girls, 15 are wearing white shirts, 12 green shirts, 18 blue shirts, 10 black shirts and 5 red shirts. Represent their information on a bar graph.