## Data Handling

## Learn and Remember

1. All these data which are mostly available to us in an unorganised form is called raw data.
2. In order to draw meaningful inferences from any given data, we need to organise these data systematically.
3. Bars have equal width with no gaps in between.
4. The range is divided in equal intervals of (years, days or any numbers).
5. The graphical representation of data in Bar forms having equal width in between is called Histogram.
6. A bar graph showing two sets of data simultaneously is called double bar graph. It is helpful for the comparision of the data of two events.
7. Frequency is the total number of the repeated data occurring in a particular entry.
8. Raw data can be 'grouped' and presented systematically through 'grouped frequency distribution',
9. Grouped data can be represented using Histogram. It is a type of bar diagram, where the class intervals are shown on the horizontal axis and the heights of the bars. Show the frequency of the class interval. Also, there is no gap between bars and there is no gap between the class intervals.
10. When data is represented using circle graph and a circle graph shows the relationship between a whole and its parts, is called a pie chart.
11. There are certain experiments whose outcomes have an equal chance of occurrence.
12. A randun experiment is one whose outcome can not be predicted exactly in advance.
13. Outcomes of an experiment are equally likely if each has the same chance of occurring.
14. Probability of an event
$=\frac{\text { Number of outcomes that makes an event }}{\text { Total number of outcomes of the experiment }}$ when the outcomes are equally likely.
15. One or more outcomes of an experiment make an event.
16. Chances and probability are related to real life.
17. Each outcome of an experiment or a collection of outcomes make an event.
18. When an experiment provides you quick result, is called a random experiment. For example, when you toss a coin and ask your friend to make a call. Can you control the result of the toss? Can you get a head if you want one or a tail if you want that? No, that is not possible. Such an experiment is called a random experiment.

## TEXTBOOK QUESTIONS SOLVED

## EXERCISE 5.1 (Page -76-77)

Q1. For which of these would you use a histogram to show the data?
(a) The number of letters for different areas in a postman's bag.
(b) The height of competitors in an athletics meet.
(c) The number of cassettes produced by 5 companies.
(d) The number of passengers boarding trains from 7:00 a.m. to 7:00 p.m. at a station. Give reasons for each.
Sol. As we know histogram is a graphical representation of data, if data represented in manner of class-interval.
(a) For case (b) and case (d). In all these cases data can be divided into class intervals. So we use histogram.
For example, a group of competitors having different heights in an athletics meet.
(d) The number of passengers boarding trains in an interval of one hour at a station.
Q2. The shoppers who come to a departmental store are marked as: man (M), woman (W), boy (B) or girl (G). The following list gives the shoppers who came during the first hour in the morning.

WWW GBWWMGGMMWWWWGBMWBGGM WW MMWWWMWBWGMWWWWGWMMWM W G W M G W MMB G G W.
Make a frequency distribution table using tally marks, Draw a bar graph to illustrate it.
Sol. We tabulate the data in frequency distribution table :

| Shopper | Tally Marks | Number of shoppers |
| :--- | :---: | :---: |
| W | $\mathbb{N}$ 代 NN NN NN III | 28 |
| M | $\mathbb{N}$ NN NN | 15 |
| B | $\mathbb{N}$ | 5 |
| G | $\mathbb{N}$ 代 II | 12 |
|  | Total | 60 |

Now, to illustrate the data by drawing bar-graph :


Q3. The weekly wages (in ₹) of 30 workers in a factory are. $830,835,890,810,835,836,869,845,898,890,820,860$, $832,833,855,845,804,808,812,840,885,835,835,836$, $878,840,868,890,806,840$.
Using tally mar.s make a frequency table with intervals as 800-310,810-820 and so on.
Sol. We represented the data by frequency distribution table using tally marks :

| Class Intervals | Tally Marks | Frequency |
| :---: | :---: | :---: |
| $800-810$ | III | 3 |
| $810-820$ | $\\|$ | 2 |
| $820-830$ | $\mid$ | 1 |
| $830-840$ | $\|\mathbb{N}\|\|\|\mid$ | 9 |
| $840-850$ | $\mid$ W | 5 |
| $850-860$ | $\mid$ | 1 |
| $860-870$ | $\|\|\mid$ | 3 |
| $870-880$ | $\mid$ | 1 |
| $880-890$ | $\mid$ | 1 |
| $890-900$ | IIII | 4 |
|  | Total | 30 |

Q4. Draw a histogram for the frequency table made for the data in Question 3, and answer the following questions.
(i) Which group has the maximum number of workers?
(ii) How many workers earn ₹ 850 and more?
(iii) How many workers earn less than ₹ 850 ?


Sol. (i) 830-840 group has the maximum number of workers.
(ii) 10 workers earn more than ₹ 850 .
(iii) 20 workers earn less than $₹ 850$.

Q5. The number of hours for which students of a particular class watched television during holidays is shown through the given graph.
We draw the histogram for above frequency table : Answer the following.
(i) For how many hours did the maximum number of students watch T.V.?
(ii) How many students watched TV for less than 4 hours?
(iii) How many students spent more than 5 hours in watching TV?


Sol. (i) The maximum number of students watched T.V. for 4-5 hours.
(ii) 34 students watched TV for less than 4 hours.
(iii) 14 students spent more than 5 hours in watching TV.

## EXERCISE 5.2 (Page-82-83)

Q1. A survey was made to find the type of music that a certain group of young people liked in a city.
Adjoining pie chart shows the findings of this survey. From this pie chart answer the following:
(i) If 20 people liked classical music, how many young people were surveyed?
(ii) Which type of music is liked by the maximum number of people?
(iii) If a cassette company were to make 1000 CD's, how many of each type would
 they make?
Sol. (i) $10 \%$ represents 100 people.
Therefore $20 \%$ represents $=\frac{100 \times 20}{10}=200$ people
Hence, 200 people were surveyed.
(ii) Light music is liked by the maximum number of people.
(iii) CD's of classical music $=\frac{10 \times 1000}{100}=100$

CD's of semi classical music $=\frac{20 \times 1000}{100}=200$
CD's of light music $=\frac{40 \times 1000}{100}=400$
CD's of folk music $=\frac{30 \times 1000}{100}=300$.
Q2. A group of $\mathbf{3 6 0}$ people were asked to vote for their favourite season from the three seasons rainy, winter and summer.
(i) Which season got the most votes?
(ii) Find the central angle of each sector.
(iii) Draw a pie chart to show this information.

| Season |  | No. of votes |
| :--- | :---: | :---: |
| Summer | Pैw | 90 |
| Rainy |  | 120 |
| Winter |  |  |

Sol. (i) Winter season got the most votes.
(ii) Central angle of summer season $=\frac{90 \times 360^{\circ}}{360}=90^{\circ}$

Central angle of rainy season $\quad=\frac{120 \times 360^{\circ}}{360}=120^{\circ}$
Central angle of winter season $=\frac{150 \times 360^{\circ}}{360}=150^{\circ}$
(iii)


Q3. Draw a pie chart showing the following information The table shows the colours preferred by a group of people.

| Colours | Number of people |
| :--- | :---: |
| Blue | 18 |
| Green | 9 |
| Red | 6 |
| Yellow | 3 |
| Total | 36 |

Sol. We have to find the proportion of each sector. For example, Blue is $\frac{18}{36}=\frac{1}{2}$; Green is $\frac{9}{36}=\frac{1}{4}$ and so on. Use this to find the corresponding angles.

| Colours | Number <br> of people | In fraction | Central angles |
| :---: | :---: | :---: | :---: |
| Blue | 18 | $\frac{18}{36}=\frac{1}{2}$ | $\frac{1}{2} \times 360^{\circ}=180^{\circ}$ |
| Green | 9 | $\frac{9}{36}=\frac{1}{4}$ | $\frac{1}{4} \times 360^{\circ}=90^{\circ}$ |
| Red | 6 | $\frac{6}{36}=\frac{1}{6}$ | $\frac{1}{6} \times 360^{\circ}=60^{\circ}$ |
| Yellow | 3 | $\frac{3}{36}=\frac{1}{12}$ | $\frac{1}{12} \times 360^{\circ}=30^{\circ}$ |



Q4. The adjoining pie chart gives the marks scored in an examination by a student in Hindi, English, Mathematics, Social Science and Science. If the total marks obtained by the students were 540, answer the following question:
(i) In which subject did the student score 105 marks? (Hint: for 540 marks, the central angle $=360^{\circ}$. So, for 105 marks, what is the central angle?)

(ii) How many more marks were obtained by the student in Mathematics than in Hindi?
(iii) Examine whether the sum of the marks obtained in Social Science and Mathematics is more than that in Science and Hindi.
(Hint. Just study the central angles).
Sol.

| Subject | Central angle | Marks obtained |
| :--- | :---: | :--- |
| Mathematics | $90^{\circ}$ | $\frac{90^{\circ}}{360^{\circ}} \times 540=135^{\circ}$ |
| S. Science | $65^{\circ}$ | $\frac{65^{\circ}}{360^{\circ}} \times 540=97.5^{\circ}$ |
| Science | $80^{\circ}$ | $\frac{80^{\circ}}{360^{\circ}} \times 540=120^{\circ}$ |
| Hindi | $70^{\circ}$ | $\frac{70^{\circ}}{360^{\circ}} \times 540=105^{\circ}$ |
| English | $55^{\circ}$ | $\frac{55^{\circ}}{360^{\circ}} \times 540=82.5^{\circ}$ |

(i) The student scored 105 marks in Hindi.
(ii) Marks obtained in Mathematics $=135$.

Marks obtained in Hindi $=105$.
Difference $=135-105=30$.
Thus, 30 more marks were obtained by the student in mathematics than in Hindi.
(iii) The sum of the marks in Social Science and Mathematics

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=97.5+135=232.5
$$

The sum of the marks in Science and Hindi $=120+105$

$$
=225
$$

Yes, the sum of the marks in Social Science and Mathematics is more than that in Science and Hindi.

Q5. The number of students in a hostel, speaking different languages is given below.
Display the data in a pie chart.

| Language | Hindi | English | Marathi | Tamil | Bengali | Total |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Number of <br> Students | 40 | 12 | 9 | 7 | 4 | 72 |

Sol.

| Language | Number of <br> students | In <br> fraction | Central <br> angles |
| :--- | :---: | :---: | :---: |
| Hindi | 40 | $\frac{40}{72}=\frac{5}{9}$ | $\frac{5}{9} \times 360^{\circ}=200^{\circ}$ |
| English | 12 | $\frac{12}{72}=\frac{1}{6}$ | $\frac{1}{6} \times 360^{\circ}=60^{\circ}$ |
| Marathi | 9 | $\frac{9}{72}=\frac{1}{8}$ | $\frac{1}{8} \times 360^{\circ}=45^{\circ}$ |
| Tamil | 7 | $\frac{7}{72}=\frac{7}{12}$ | $\frac{7}{72} \times 360^{\circ}=35^{\circ}$ |
| Bengali | 4 | $\frac{4}{72}=\frac{1}{18}$ | $\frac{1}{18} \times 360^{\circ}=20^{\circ}$ |
| Total | 72 |  |  |

Pie chart at above given data.


## EXERCISE 5.3 (Page - 87)

Q1. List the outcomes you can see in these experiments. (a) Spinning a wheel (b) Tossing two coins together


Sol. (a) There are four letters A, B, C and D in a spinning wheel. So, there are four outcomes.
(b) When two coins are tossed together. There are four possible outcomes HH, HT, TH, TT.
(Here HT means head on first coin and tail on the second coin and so on.)
Q2. When a die is thrown, list the outcomes of an event of getting
(i) (a) a prime number
(b) not a prime number.
(ii) (a) a number greater than 5
(b) a number not greater than 5 .

Sol. When a die is thrown there are six outcomes that are 1,2,3, 4,5 and 6.
(i) (a) Outcomes of event of getting a prime number are 2,3 and 5.
(b) Outcomes of event of not getting a prime number are 1,4 and 6.
(ii) (a) Outcomes of event of getting a number greater than 5 is 6 .
(b) Outcomes of event of not getting a number greater than 5 are 1, 2, 3, 4 and 5.
Q3. Find the.
(a) Probability of the pointer stopping on D in (Question 1-(a))?
(b) Probability of getting an ace from a well shuffled deck of 52 playing cards?
(c) Probability of getting a red apple. (See figure alongside)

Sol. (a) In a spinning wheel, there are five pointers A, A, B, C, D. So, there are five outcomes. Pointer stops at D which is one outcome.
So, the probability of the pointer stopping on $\mathrm{D}=\frac{1}{5}$.

(b) There are four ace in a deck of 52 playing cards. So, there are four events of getting an ace.
So, probability of getting an ace $=\frac{4}{52}=\frac{1}{13}$.
(c) Total number of apples $=7$

Number of red apples $=4$
Probability of getting red apple $=\frac{4}{7}$.
Q4. Numbers 1 to 10 are written on ten separate slips (one number on one slip), kept in a box and mixed well. One slip is chosen from the box without looking into it. What is the probability of.
(i) getting a number 6 ?
(ii) getting a number less than 6 ?
(iii) getting a number greater than 6 ?
(iv) getting a 1 -digit number?

Sol. (i) Outcome of getting a number 6 from ten separate slips is one.
Therefore, probability of getting a number $6=\frac{1}{10}$.
(ii) Numbers less than 6 are 1,2,3, 4 and 5 which are five. So, there are five outcomes.
Therefore, probability of getting a number less than $6=$ $\frac{5}{10}=\frac{1}{2}$.
(iii) Number greater than 6 out of ten that are 7, 8, 9, 10. There are four possible outcomes.
Therefore, probability of getting a number greater than $6=\frac{4}{10}=\frac{2}{5}$.
(iv) One digit numbers are 1, 2, 3, 4, 5, 6, 7, 8, 9 out of ten. Therefore, probability of getting a 1 -digit number $=\frac{9}{10}$.

Q5. If you have a spinning wheel with 3 green sectors, I blue sector and 1 red sector, what is the probability of getting a green sector? What is the probability of getting a non blue sector?
Sol. There are five sectors. Three sectors are green out of five sectors.
Therefore, probability of getting a green sector $=\frac{3}{5}$.
There is one blue sector out of five sectors.
Non-blue sectors $=5-1=4$ sectors
Therefore, probability of getting a non-blue sector $=\frac{4}{5}$.
Q6. Find the probabilities of the events given in Question 2.
Sol. When a die is thrown there are six outcomes i.e., $1,2,3,4,5$ and 6.
(i) (a) 2, 3, 5 are prime numbers which are 3 outcomes out of 6 .

Therefore, probability of getting a prime number $=\frac{3}{6}$
$=\frac{1}{2}$.
(b) 1, 4, 6 are not prime numbers. There are 3 outcomes out of 6 .
Therefore, probability of not getting a prime number
$=\frac{3}{6}=\frac{1}{2}$.
(ii) (a) Only 6 is greater than 5 .

There is one outcome out of 6 .
Therefore, probability of getting a number greater than $5=\frac{1}{6}$.
(b) Numbers not greater than 5 are 1,2,3,4 and 5. There is 5 outcomes out of 6 .
Therefore, probability of not getting a number greater than $5=\frac{5}{6}$.

