Name : _____

Grade : VIII

Subject : Mathematics

Chapter : 5. Data Handling

Objective Type Questions

1 Marks

I. Multiple choice questions

1. The height of rectangle in a histogram shows the : **[NCERT Exemplar]**

(a) Width of the class (b) Upper limit of the class

(c) Lower limit of the class (d) Frequency of the class

2. A geometric representation showing the relationship between a whole and its parts is a : **[NCERT Exemplar]**

(a) Pie chart (b) Histogram (c) Bar graph (d) Pictograph

3. In a pie chart, the total angle of the centre of the circle is : **[NCERT Exemplar]**

(a) 180° (b) 360° (c) 270° (d) 90°

4. The range of the data 30, 61, 55, 56, 60, 20, 26, 28, 56 is : **[NCERT Exemplar]**

(a) 26 (b) 30 (c) 41 (d) 61

5. Which of the following is not a random experiment ? **[NCERT Exemplar]**

(a) Tossing a coin

(b) Rolling a dice

(c) Choosing a card from a deck of 52 cards

(d) Throwing a stone from a roof of a building

6. What is the probability of choosing a vowel from the alphabets ? **[NCERT Exemplar]**

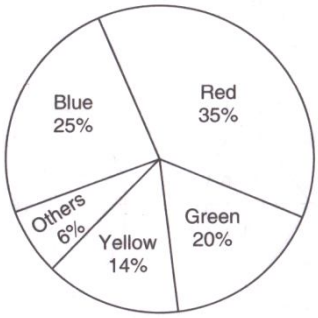
(a) $\frac{21}{26}$ (b) $\frac{5}{26}$ (c) $\frac{1}{26}$ (d) $\frac{2}{36}$

7. In a school only, 3 out of 5 students can participate in a competition. What is the probability of the students who do not make it to the competition ? **[NCERT Exemplar]**

(a) 0.65 (b) 0.4 (c) 0.45 (d) 0.6

Students of a class voted for their favourite colour and a pie chart was prepared based on the data collected.

Observe the pie chart given below and answer questions 8 - 10 based on it.



8. Which colour received $\frac{1}{5}$ of the votes ? **[NCERT Exemplar]**

(a) Red (b) Blue (c) Green (d) Yellow

9. If 400 students voted in all, then how many did vote 'Others' colour as their favourite ? **[NCERT Exemplar]**

(a) 6 (b) 20 (c) 24 (d) 40

10. Which of the following a reasonable conclusion for the given data? **[NCERT Exemplar]**

(a) $\frac{1}{20}$ th student voted for blue colour

(b) Green is the popular colour

(c) The number of students who voted for red colour is two times the number of students who voted for yellow colour

(d) Number of students liking together yellow and green colour is approximately the same as those for red colour.

11. Listed below are the temperature in °C for 10 days. -6, -8, -7, 0, 3, 2, 1, 5, 4, 4 **[NCERT Exemplar]**

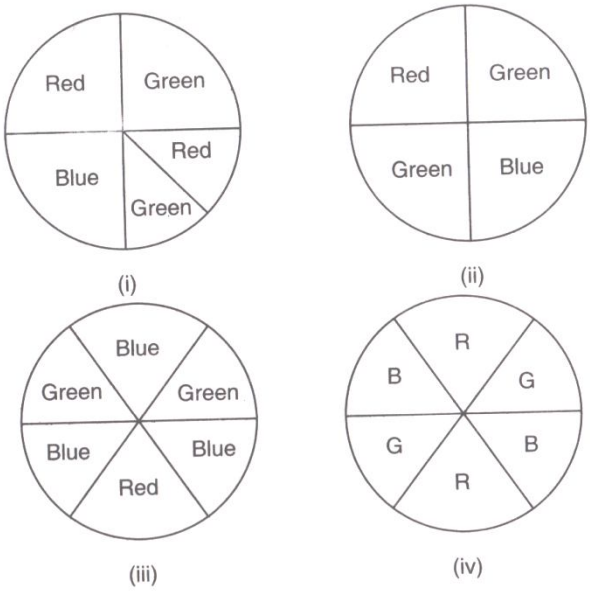
What is the range of the data ?

(a) 8 (b) 13°C (c) 10°C (d) 12°C

12. Ram puts some buttons on the table. There were 4 blue, 7 red, 3 black and 6 white buttons in all. All of a sudden, a cat jumped on the table and knocked out one button on the floor. What is the probability that the button on the floor is blue ? **[NCERT Exemplar]**

(a) $\frac{7}{20}$ (b) $\frac{3}{5}$ (c) $\frac{1}{5}$ (d) $\frac{1}{4}$

13. Rahul, Varun and Yash are playing a game of spinning a coloured wheel. Rahul wins, if spinner lands on red. Varun wins, if spinner lands on blue and Yash wins, if it lands on green. Which of the following spinner should be used to make the game fair? **[NCERT Exemplar]**



(a) (i) (b) (ii) (c) (iii) (d) (iv)

14. In a frequency distribution with classes 0 - 10, 10 - 20 etc, the size of the class intervals is 10. The lower limit of fourth class is : [NCERT Exemplar]

(a) 40 (b) 50 (c) 20 (d) 30

15. A coin is tossed 200 times and head appeared 120 times. Probability of getting a head in this experiment is [NCERT Exemplar]

(a) $\frac{2}{5}$ (b) $\frac{3}{5}$ (c) $\frac{1}{5}$ (d) $\frac{4}{5}$

1. (d)	2. (a)	3. (b)	4. (c)	5. (d)	6. (b)	7. (b)	8. (c)
9. (c)	10. (d)	11. (b)	12. (c)	13. (d)	14. (d)	15. (b)	

II. Multiple choice questions

1. The height of a rectangle in a histogram shows the **[NCERT Exemplar]**

a. width of the class b. upper limit of the class

c. lower limit of the class d. frequency of the class

2. Listed below are the temperature in ^{0}C for 10 days. **[NCERT Exemplar]**

-6, -8, 0, 3, 2, 0, 1, 5, 4, 4

What is the range of the data?

a. 8^0 b. 13^0C c. 10^0C d. 12^0C

3. A graph showing two sets of data simultaneously is known as **[NCERT Exemplar]**

a. pictograph b. histogram c. pie chart d. double bar graph

4. Data represented using circles is known as

a. bar graph b. histogram c. pictograph d. pie chart

5. Data collected in a survey shows that 40% of the buyers are interested in buying a particular brand of toothpaste. The central angel of sector of the pie chart representing this information is **[NCERT Exemplar]**

a. 120^0 b. 150^0 c. 144^0 d. 40^0

6. What is the probability of choosing a vowel from the alphabets? **[NCERT Exemplar]**

a. $\frac{21}{26}$ b. $\frac{5}{26}$ c. $\frac{1}{26}$ d. $\frac{3}{26}$

7. Which of the following is not a random experiment? **[NCERT Exemplar]**

a. Tossing a coin

b. Rolling a dice

c. Choosing a card from a deck of 52 cards

d. Throwing a stone from a roof of a building

8. Ram put some buttons on the table. There were 4 blue, 7 red, 3 black and 6 white buttons in all. All of a sudden, a cat jumped on the table and knocked out one button on the floor. What is the probability that the button on the floor is blue? **[NCERT Exemplar]**

a. $\frac{7}{20}$ b. $\frac{3}{5}$ c. $\frac{1}{5}$ d. $\frac{1}{4}$

9. A coin is tossed 12 times and the outcomes are observed as shown below.

The chance of occurrence of Head is **[NCERT Exemplar]**

a. $\frac{1}{2}$ b. $\frac{5}{12}$ c. $\frac{7}{12}$ d. $\frac{5}{7}$

10. A dice is tossed two times. The number of possible outcomes in **[NCERT Exemplar]**

a. 12 b. 24 c. 36 d. 30

11. A glass jar contains 6 red, 5 green, 4 blue and 5 yellow marbles of same size. Hari takes out a marble from the jar at random. What is the probability that the chosen marble is of red colour? **[NCERT Exemplar]**

a. $\frac{7}{10}$ b. $\frac{3}{10}$ c. $\frac{4}{5}$ d. $\frac{2}{5}$

12. Total number of outcomes, when a ball is drawn from a bag which contains 3 red, 5 black and 4 blue balls is **[NCERT Exemplar]**

a. 8 b. 7 c. 9 d. 12

13. Number 1 to 5 are written on separate slips, i.e., one number on one slip and put in a box. Wahida pick a slip from the box without looking at it. What is the probability that the slip bears an odd number? **[NCERT Exemplar]**

a. $\frac{1}{5}$ b. $\frac{2}{5}$ c. $\frac{3}{5}$ d. $\frac{4}{5}$

14. A coin is tossed three times. The number of possible outcomes is **[NCERT Exemplar]**

a. 3 b. 4 c. 6 d. 8

1. d	2. b	3. d	4. d	5. c	6. b	7. d
8. c	9. b	10. c	11. b	12. d	13. c	14. d

I. Fill in the blanks

1. Data available in an unorganised form is called _____ data. [NCERT Exemplar]
2. In the class interval 20 - 30, the lower class limit is _____. [NCERT Exemplar]
3. In the class interval 26 - 33, 33 is known as _____. [NCERT Exemplar]
4. The range of the data 6, 8, 16, 22, 8, 20, 7, 25, is _____. [NCERT Exemplar]
5. A pie chart is used to compare _____to a whole. [NCERT Exemplar]

1. raw	2. 20	3. upper limit	4. 19	5. parts

I. True or False

1. In a pie chart a whole circle is divided into sectors. [NCERT Exemplar]
2. The central angle of a sector in a pie chart cannot be more than 180°. [NCERT Exemplar]
3. Sum of all the central angles in a pie chart is 360°. [NCERT Exemplar]
4. In a pie chart two central angles can be of 180°. [NCERT Exemplar]
5. In a pie chart two or more central angles can be equal. [NCERT Examplar]

1. True	2. False	3. True	4. True	5. True

I. Very Short Answer Type Questions.

1. Read the frequency distribution table given below answer the questions that follow :

[NCERT Exemplar]

Class Interval	Frequency
25 - 35	1
35 - 45	5
45 - 55	5
55 - 65	4
65 - 75	0
75 - 85	8
85 - 95	2
Total	25

(a) Class interval which has the lowest frequency.

(b) Class interval which has the highest frequency.

(c) What is the class size of the intervals ?

(d) What is the upper limit of the fifth class ?

(e) What is the lower limit of the last class ?

Sol. (a) 65 - 75

(b) 75 - 85

(c) 10

(d) 75

(e) 85

2. Given below is a frequency distribution table. Read it and answer the questions that follow.

Class interval	Frequency
10 - 20	5
20 - 30	10
30 - 40	4
40 - 50	15
50 - 60	12

(a) What is the lower limit of the second class interval ?

(b) What is the upper limit of the last class interval ?

(c) What is the frequency of the third class ?

(d) Which interval has a frequency of 10 ?

(e) Which interval has the lowest frequency ?

(f) What is the class size ? [NCERT Exemplar]

Sol. (a) 20

(b) 60

(c) 4

(d) 20-30

(e) 30-40

(f) 10

3. Classify the following statements under ,-SPpropriate headings. [NCERT Exemplar]

(a) Getting the sum of angles of a triangle as 180°.

(b) India winning a cricket match against Pakistan.

(c) Sun setting in the evening.

(d) Getting 7 when a die is thrown.

(e) Sun rising from the west.

(f) Winning a racing competition by you.

Certain to happen	Impossible to happen	May or may not happen

Sol. (a) Certain to happen

(b) May or may not happen

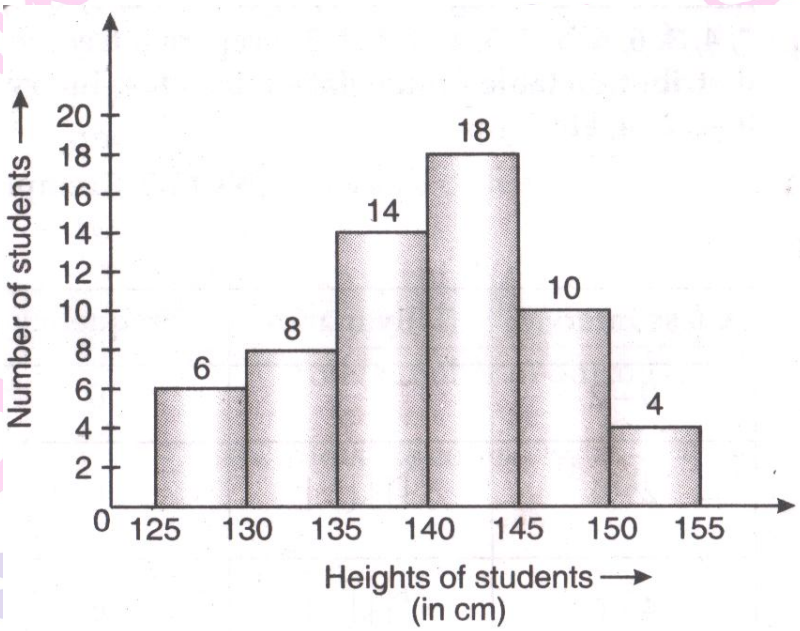
(c) Certain to happen

(d) Impossible to happen

(e) Impossible to happen

(f) May or may not happen

4. Look at the histogram below and answer the questions that follow. [NCERT Exemplar]



(a) How many students have height more than or equal to 135 cm but less than 150 cm ?

(b) Which class interval has the least number of students ?

(c) What is the class size ?

(d) How many students have height less than 140 cm ?

Sol. (a) 14 + 18 + 10 = 42

(b) 150-155

(c) 5

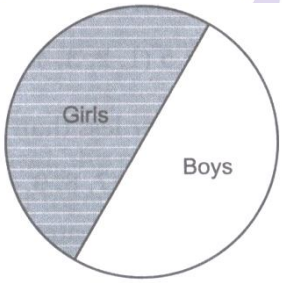
(d) 6 + 8 +14 = 28

II. Very Short Answer Type Questions.

1. If we change the position of any of the bars of a graph, would it change the information being conveyed? Why?

If the height of a bar remains unchanged, then changing of its position does not change the information being conveyed.

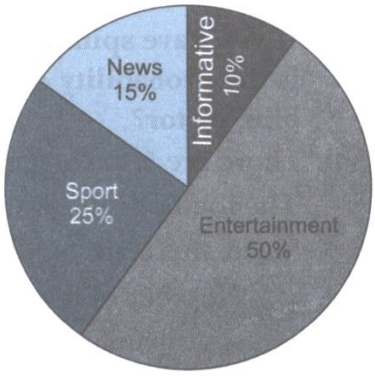
2. The following pie charts gives you a different piece of information about your class. Find the fraction of the circle representing the information.



3. Answer the following questions based on the pie chart given.

(i) Which type of programmes are viewed the most?

(ii) Which two types of programmes have number of viewers equal to those watching sports channels?



Viewers watching different types of channels on T.V.

Sol. (i) The entertainment programmes are viewed the most.

(ii) The news and informative programmes have the equal number of viewers to those watching sports channels.

4. Which form of graph would be appropriate to display the following data? Production of food gains of a state is given below.

Year	2001	2002	2003	2004	2005	2006
Production (in lakh tons)	60	50	70	55	80	85

A bar graph will be an appropriate representation of the above data.

5. Which form of graph would be appropriate to display the following data? Choice of food for a group of people is given below.

Favourite food	North Indian	South Indian	Chinese	Others	Total
Number of people	30	40	25	25	120

A circle graph (or a pie chart).

6. Which form of graph is appropriate to display the following data? The daily income of a group of a factory workers is given below.

Daily income (in ')	Number of workers (in a factory)
75-100	45
100-125	35
125-150	55
150-175	30
175-200	50
200-225	125
225-250	140
Total	**480**

A histogram would be appropriate representation of the above data.

7. When a die is thrown, what are the possible outcomes?

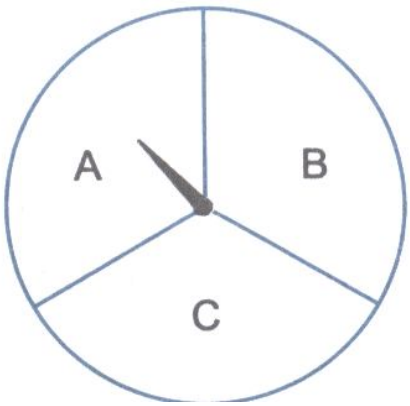
The possible outcomes are 1,2,3,4,5 or 6.

8. You have a bag with five identical balls of different colours (White, red, blue, green and yellow) and you are to pull out a ball without looking at it. List the outcomes you would get.

The possible outcomes are W, R, B, G or Y.

9. When you spin the wheel shown, what are the possible outcomes?

The possible outcomes are A, B or C.



I. Short Answer Type Questions-1

1. Given below are the height (in cm) of 11 boys of a class :

146, 143 ,148, 132, 128, 139, 140, 152, 154, 142, 149 Arrange the above data in ascending order and find :

(a) the height of the tallest boy.

(b) the height of the shortest boy.

(c) the range of the given data. [NCERT Exemplar]

Sol. Arranging the given data in ascending order, we get the height (in cm) as :

128' 132, 139, 140, 142, 143, 146, 148, 149, 152, 154.

(a) 154

(b) 128

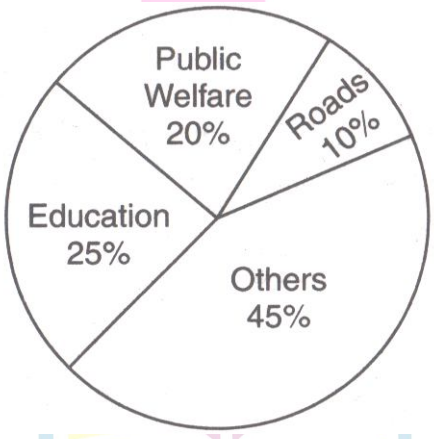
(c) 26

2. The following pie chart depicts the expenditure of a state government under different heads. [NCERT Exemplar]

(a) If the total spending is 10 crores, how much money was spent on roads ?

(b) How many times is the amount of money spent on education compared to the amount spent on roads ?

(c) What fraction of the total expenditure is spent on both roads and public welfare together ?



Sol. (a) Money spent on roads = 10% of 10 crores

$= \frac{10}{100} \times 10$ crores = 1 crore

(b) Money spent on education = 25% of 10 crores

= 25000000

Money spent on road = 10000000

$\Rightarrow \quad \frac{25000000}{10000000}$ - 2.5 times

(c) Total expenditure = 100000000

Money spent on both roads and public welfare

= 10% + 20% = 30%

So, fraction = $\frac{3 \text{ crores}}{10 \text{ crores}} = \frac{3}{10}$

3. Following are the number of members in 25 families of a village 6, 8, 7, 7, 6, 5, 3, 2, 5, 6, 8, 7, 7, 4, 3, 6, 6, 6, 7, 5, 4, 3, 3, 2, 5. Prepare a frequency distribution table for the data using class intervals 0 -2, 2 -4, etc. [NCERT Exemplar]

Sol.

Class interval	Tally marks	Frequency
0 – 2		0
2 – 4	𝍸 |	6
4 – 6	𝍸 |	6
6 – 8	𝍸 𝍸 |	11
8 – 10	||	2
	Total	**25**

4. The marks obtained (out of 20) by 30 students of a class in a test are as follows : [NCERT Exemplar]

14, 16, 15, 11, 15, 14, 13, 16, 8, 10, 7, 11, 18, 15, 14, 19, 20, 7, 10, 13, 12, 14, 15, 13, 16, 17, 14,

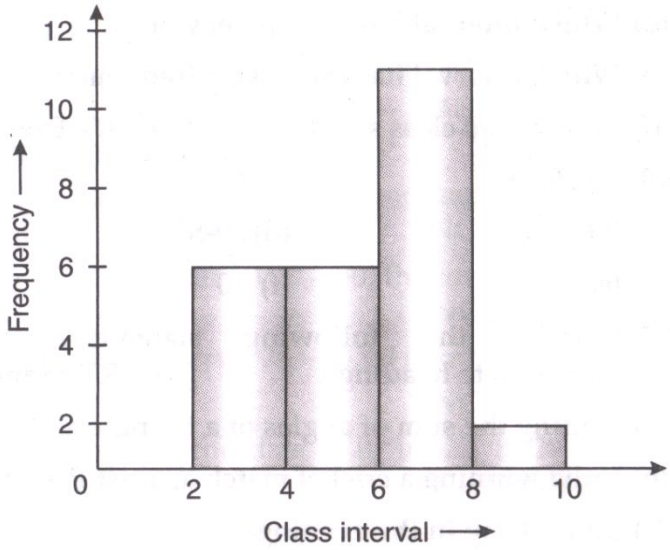
11, 10, 20. Prepare a frequency distribution table for the above data using class intervals of equal width one class interval is 4 -8 (excluding 8 and including 4.)

Sol.

Class interval	Tally marks	Frequency
4 – 8	||	2
8 – 12	𝍸 ||	7
12 – 16	𝍸 𝍸 |||	13
16 – 20	𝍸 |	6
20 – 24	||	2
	Total	**30**

5. Draw a histogram to represent the frequency distribution for the number of members in 25 families of a village 6, 8, 7, 7, 6, 5, 3, 2, 5, 6, 8, 7, 7, 4, 3, 6, 6, 6, 7 ,5, 4, 3, 3, 2, 5. **[NCERT Exemplar]**

Sol.



6. Ritwik draws a ball from a bag that contains white and yellow balls. The probability of choosing a white ball is $\frac{2}{9}$. If the total number of balls in the 9 bag is 36, find the number of yellow balls.

Sol. Let no. of yellow ball, in a bag = x

Then, probability of choosing yellow ball

$$= P(Y) = \frac{x}{36}$$

and probability of choosing white ball

$$P(W) = \frac{2}{9} \text{ (given)}$$

$\therefore$ $P(Y) + P(W) = 1$

$$\frac{x}{36} + \frac{2}{9} = 1$$

$$\frac{x+8}{36} = 1 \Rightarrow x + 8 = 36$$

$\Rightarrow$ $x = 28$

$\therefore$ No. of yellow balls = 28

7. Given below is a pie chart showing the time spend by a group of 350 children in different games. Observe it and answer the questions that follow.

(a) How many children spend at least less than one hour in playing games ?

(b) How many children spend more than 2 hours in playing games ?

(c) How many children spend 3 or lesser hours in playing games ?

(d) Which is greater - number of children who spend 2 hours or more per day or number of children who play for less than one hour ? [NCERT Exemplar]

Sol. (a) Less than 1 hour = 6% of 350 = $\frac{6 \times 350}{100}$ 21

∴ No.of Children who spend at least less than one hour = 350 - 21 = 329

(b) More than 2 hours = 34% + 10% + 4% = 48%

$$\frac{48 \times 350}{100} = 168$$

(c) 3 or lesser hours = 6% + 16% + 30% + 34% = 86%

$$\frac{86 \times 350}{100} = 301$$

(d) 2 hour or more is greater number

8. In a survey of 200 ladies, it has found that 82 like coffee while 118 dislike it. From these ladies, one is chosen at random. What is the probability that the chosen lady dislikes coffee ? [NCERT Exemplar]

Sol. Since, Total number of outcomes = 200

and Like coffee = 82

and Dislike coffee = 118

We know that,

Probability of an event P (E)

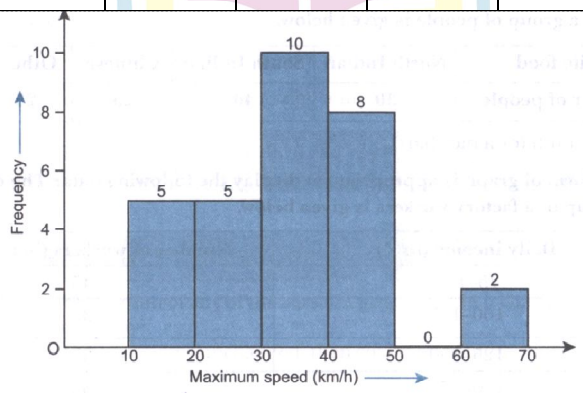
$$= \frac{\text{Favourable Outocmes}}{\text{Total number of outcomes}}$$

Then, P (dislike coffee) = $\frac{118}{200} = \frac{59}{100}$

II. Short Answer Type Questions.

1. The top speed of thirty different land animals have been organised into a frequency table. Draw a histogram for the given data. [NCERT Exemplar]

Maximum Speed (km/h)	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	5	5	10	8	0	2



2. Classify the following statement under appropriate headings. [NCERT Exemplar]

(i) Getting the sum of angles of a triangle as 180°.

(ii) India winning a cricket match against Pakistan.

(iii) Sun setting in the evening.

(iv) Getting 7 when a die is thrown.

(v) Sun rising from the West.

(vi) Winning a racing competition by you.

Sol.

Certain to happen	Impossible to happen	May or may not happen
(i)	(iv)	(ii)
(iii)	(v)	(vi)

3. Ritwik draws a ball from a bag that contains white and yellow balls. The probability 9 2 of choosing a white ball is - If the total number of balls in the bag is 36, find the number of yellow balls. [NCERT Exemplar]

Sol. Total number of outcomes = 36

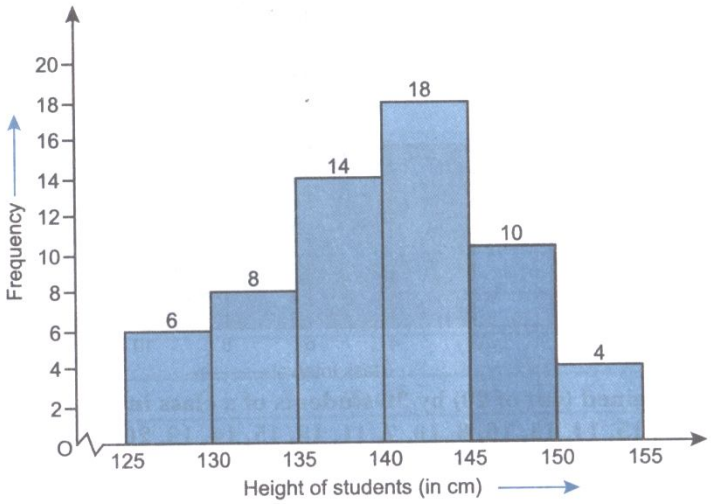
$$P(\text{Choosing a white ball}) = \frac{\text{Number of white balls}}{\text{Total number of balls}}$$

$$\frac{2}{9} = \frac{\text{Number of white balls}}{36}$$

$$\text{Number of white balls} = \frac{2 \times 36}{9} = 8$$

The number of yellow balls = 36 — 8 = 28

4. Look at the histogram below and answer the questions that follow. [NCERT Exemplar]



(i) How many students have height more than or equal to 135 cm but less than 150 cm?

(ii) Which class interval has the least number of students?

(iii) What is the class size?

(iv) How many students have height less than 140 cm?

Sol. (i) Number of students having height more than or equal to 135 cm but less than 150 cm = 14 + 18 + 10 = 42.

(ii) 150 — 155 have least number of students.

(iii) Class size = upper class limit — lower class limit = 155 — 150 = 5.

(iv) Number of student having height less than 140 cm = 6 + 8 + 14 = 28.

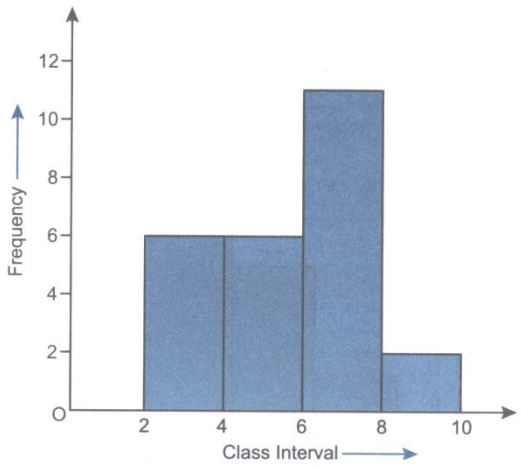
5. Following are the number of members in 25 families of a village: 6, 8, 7, 7, 6, 5, 3, 2, 5, 6, 8, 7, 7, 4, 3, 6, 6, 6, 7, 5, 4, 3, 3, 2, 5. Prepare a frequency distribution table for the data using class intervals [NCERT Exemplar]

Sol.

Class Interval	Tally marks	Frequency
0–2		0
2–4	𝍸 |	6
4–6	𝍸 |	6
6–8	𝍸 𝍸 |	11
8–10	||	2
	Total	**25**

6. Draw a histogram to represent the frequency distribution as per the table given in question 5. [NCERT Exemplar]

Sol.



7. The marks obtained (out of 20) by 30 students of a class in a test are as follows:

14, 16, 15, 11, 15, 14, 13, 16, 8, 10, 7, 11, 18, 15, 14, 19, 20, 7, 10, 13, 12, 14, 15, 13, 16, 17, 14, 11, 10, 20.

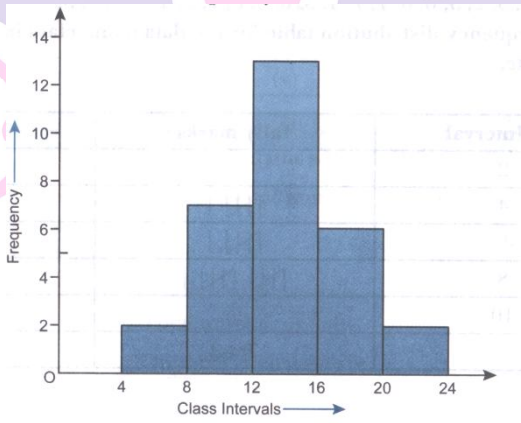
Prepare a frequency distribution table for the above data using class intervals of equal width in which one class interval is 4 - 8 (excluding 8 and including 4).

[NCERT Exemplar]

Class Interval	Tally marks	Frequency
4–8	||	2
8–12	𝍸 ||	7
12–16	𝍸 𝍸 |||	13
16–20	𝍸 |	6
20–24	||	2
	Total	30

8. Prepare a histogram from the frequency distribution table obtained in questions?

[NCERT Exemplar]



9. The weight (in kg) of 30 students of a class are: 39, 38, 36, 38, 40, 42, 43, 44, 33, 33, 31, 45, 46, 38, 37, 31, 30, 39, 41, 41, 46, 36, 35, 34, 39, 43, 32, 37, 29, 26.

Prepare a frequency distribution table using one class interval as (30 - 35), 35 not included. [NCERT Exemplar]

(i) Which class has the least frequency?

(ii) Which class has the maximum frequency?

Sol.

Class Interval	Tally marks	Frequency
25–30	||	2
30–35	𝍸 ||	7
35–40	𝍸 𝍸 |	11
40–45	𝍸 ||	7
45–50	|||	3
	Total	30

(i) 25-30 (ii) 35-40

10. Construct a frequency distribution table for the following weights (in grams) of 35 mangoes, using the equal class intervals, one of them is 40-45 (45 not included).

30, 40, 45, 32, 43, 50, 55, 62, 70, 70, 61, 62, 53, 52, 50, 42, 35, 37, 53, 55, 65, 70, 73, 74, 45, 46, 58, 59, 60, 62, 74, 34, 35, 70, 68.

(i) How many classes are there in the frequency distribution table?

(ii) Which weight group has the highest frequency? [NCERT Exemplar]

Sol.

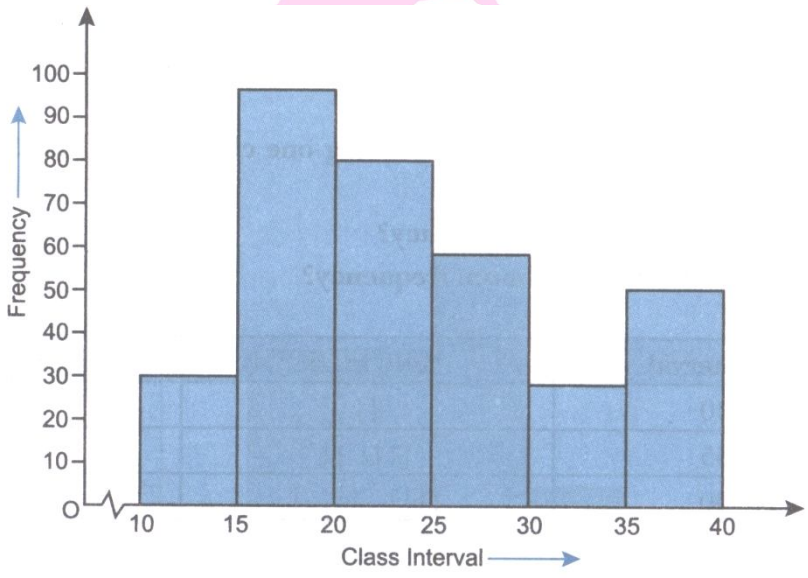
Class Interval	Tally marks	Frequency
30–35	|||	3
35–40	|||	3
40–45	|||	3
45–50	|||	3
50–55	𝍸	5
55–60	||||	4
60–65	𝍸	5
65–70	||	2
70–75	𝍸 ||	7
	Total	35

(i) 9 (ii) 70-75

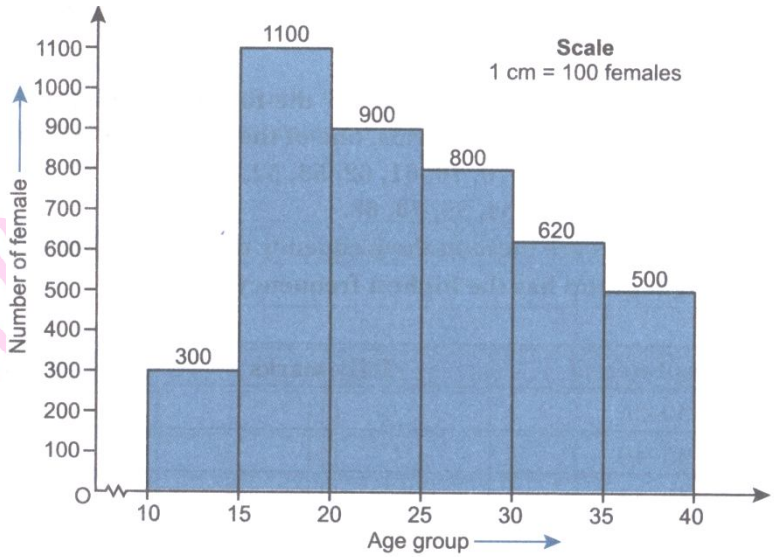
11. Draw a histogram for the following data. **[NCERT Exemplar]**

Class Interval	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	30	98	80	58	29	50

Sol.



12. The below histogram shows the number of literate females in the age group of 10 to 40 years in a town.



(i) Write the classes assuming all the classes are of equal width.

(ii) What is the class width?

(iii) In which age group are literate females the least?

(iv) In which age group is the number of literate females the highest? [NCERT Exemplar]

Sol. (i) 10 — 15, 15 — 20, 20 — 25, 25 — 30, 30 — 35, 35 — 40 are the classes of equal width.

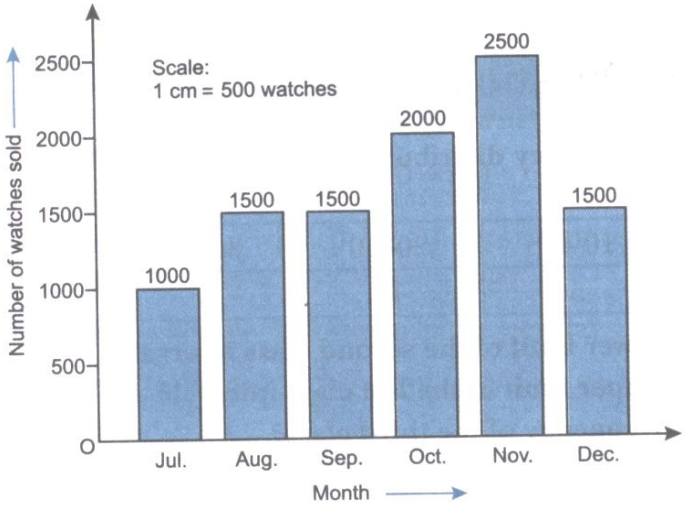
(ii) 5 is the class width.

(iii) 10 — 15 is the age group in which literate females are the least.

(iv) 15 — 20 is the age group in which literate females are the highest.

13. Draw an appropriate graph to represent the given information.

Month	**Jul.**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Number of watches sold	1000	1500	1500	2000	2500	1500

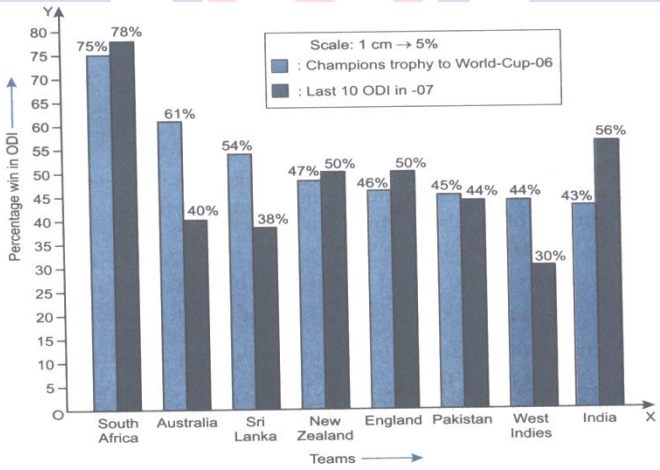


14. Percentage wins in ODI by 8 top cricket teams.

Teams	From champions trophy to world Cup-06	Last 10 ODI in 07
South Africa	75%	78%
Australia	61%	40%
Sri Lanka	54%	38%
New Zealand	47%	50%
England	46%	50%
Pakistan	45%	44%
West Indies	44%	30%
India	43%	56%

Draw a double bar graph for the above date.

Sol. Note: A bar graph showing two sets of data simultaneously is called a double-bar graph. It is useful for the comparison of the data.



I. Long Answer Type Questions.

1. The number of cycles produced in a factory during five consecutive weeks is given below:

Week	First	Second	Third	Fourth	Fifth
Number of cycles produced	800	1300	1060	920	1440

Draw a bar graph representing the above information.

Sol. We can draw the bar graph by using the following steps :

Step 1. On a graph paper, draw a horizontal line OX and a vertical line OY, representing the x-axis and y-axis respectively.

Step 2. Along OX, mark the weeks at points taken at equal gaps.

Step 3. Choose the scale :

1 small division = 20 cycles

Step 4. The height of the bars are : 1 x 800 ,20

Production in the 1st weak = $\left(\frac{1}{20} \times 800\right)$

= 40 small divisions

Production in the 2nd weak = $(\frac{1}{20} \times 1300 = 65$

small divisions.

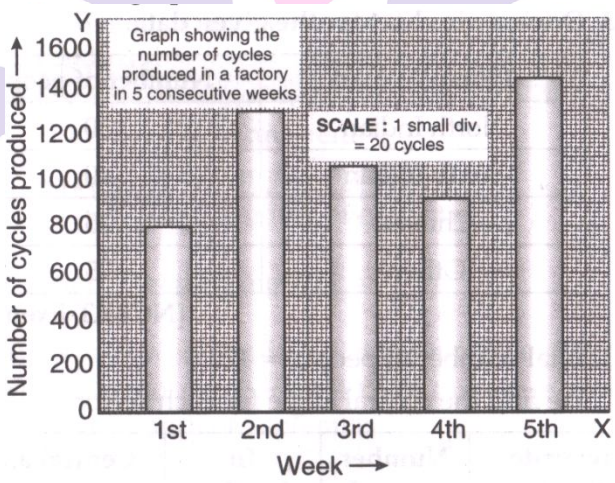
Production in the 3rd weak = $(\frac{1}{20} \times 1300 = 53$ small divisions.

Production in the 4th weak = $(\frac{1}{20} \times 920 = 46$ small) divisions.

Production in the 5th weak = $\left(\frac{1}{20} \times 1440\right) = 72$ small divisions.

Step 5. Draw bars of equal width and heights calculated in step 4 at the points marked in step 2.

The bar graph is shown below :



2. Shoes of the following brands are sold in Nov. 4:107 at a shoe store. Construct a pie chart for the data. **[NCERT Exemplar]**

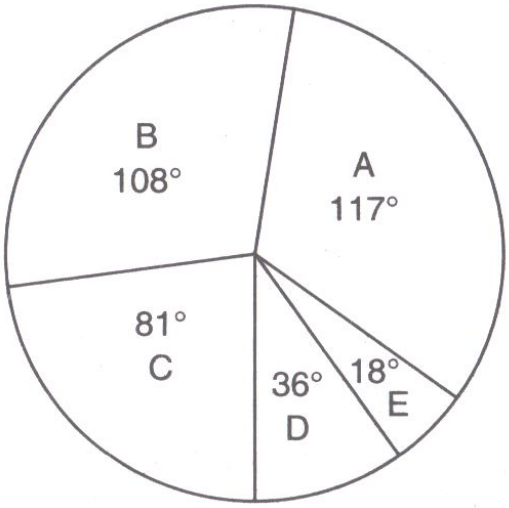
Brand	Number of pair of shoes sold
A	130
B	120
C	90
D	40
E	20

Sol. Total number of shoes = 400

We find the central angle for each sector

Brand	Number of shoes	In fraction	central angle
A	130	$\frac{130}{400}=\frac{13}{40}$	$\frac{13}{40}\times 360^\circ = 117^\circ$
B	120	$\frac{120}{400}=\frac{3}{10}$	$\frac{3}{10}\times 360^\circ = 108^\circ$
C	90	$\frac{90}{400}=\frac{9}{40}$	$\frac{9}{40}\times 360^\circ = 81^\circ$
D	40	$\frac{40}{400}=\frac{1}{10}$	$\frac{1}{10}\times 360^\circ = 36^\circ$
E	20	$\frac{20}{400}=\frac{1}{20}$	$\frac{1}{20}\times 360^\circ = 18^\circ$

The pie chart is



3. Draw a pie chart for the given data.

Favourite food	Number of people
North Indian	30
South Indian	40
Chinese	25
Others	25

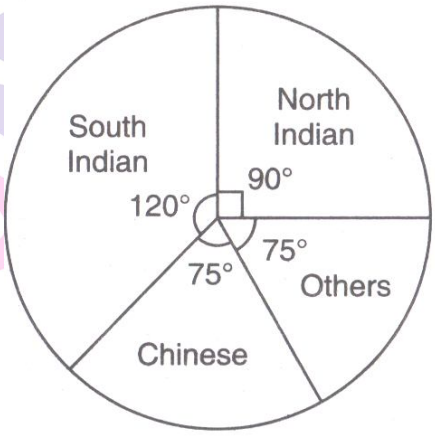
[NCERT Exemplar]

Sol. Total number of people = 120

We find the central angle for each sector.

Favourite food	Number of people	In fraction	Central angle
North Indian	30	$\frac{30}{120}=\frac{1}{4}$	$\frac{1}{4}\times 360^\circ = 90^\circ$
South Indian	40	$\frac{40}{120}=\frac{1}{3}$	$\frac{1}{3}\times 360^\circ = 120^\circ$
Chinese	25	$\frac{25}{120}=\frac{5}{24}$	$\frac{5}{24}\times 360^\circ = 75^\circ$
Others	25	$\frac{25}{120}=\frac{5}{24}$	$\frac{5}{24}\times 360^\circ = 75^\circ$

The pie chart is



4. A dice in rolled once. What is the probability that the number on top will be

[NCERT Exemplar]

(a) Odd

(b) Greater than 5

(c) A multiple of 3

(d) Less than 1

(e) A factor of 36

(f) A factor of 6

Sol. (a) Total no. in a dice = 6

Odd = 1, 3, 5 i.e. 3 numbers

$\therefore$ Probability = $\frac{3}{6} = \frac{1}{2}$

(b) Greater than 5 = 6 i.e. 1 number

∴ Probability = $\frac{1}{6}$

(c) Multiple of 3 = 3, 6 i.e. 2 numbers

Probability = $\frac{2}{6} = \frac{1}{3}$

(d) Less than 1 = no number i.e. 0

Probability = $\frac{0}{6} = 0$

(e) Factor of 36 = 1, 2, 3, 4, 6 i.e. 5 numbers

Probability = $\frac{5}{6}$

(f) Factor of 6 = 1, 2, 3, 6 i.e. 4 numbers

Probability = $\frac{4}{6} = \frac{2}{3}$

5. In a hypothetical sample of 20 people, the amount of money (in thousands of rupees) with each was found to be as follows :

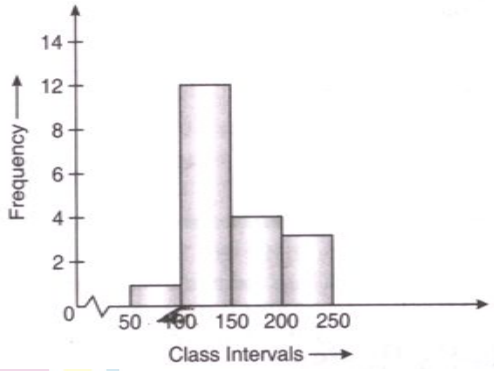
114, 108, 100, 98, 101, 109, 117, 119, 126, 131, 136, 143, 156, 169, 182, 195, 207, 219, 235, 118.

Draw a histogram of the frequency distribution, taking one of the class interval as 50 -100.

[NCERT Exemplar]

Class Interval	Frequency
50 – 100	1
100 – 150	12
150 – 200	4
200 – 250	3

1



II. Long Answer Type Questions.

1. Given below is a frequency distribution table. Read it and answer the questions that follow:

Class Interval	10-20	20-30	30-40	40-50	50-60
Frequency	5	10	4	15	12

i. What is the lower limit of the second class interval? [NCERT Exemplar]

ii. What is the upper limit of the last class interval?

iii. What is the frequency of the third class?

iv. Which interval has a frequency of 10?

v. Which interval has the lowest frequency?

vi. What is the class size?

Sol. i. The second class interval is 20-30.

∴ The lower limit = 20.

ii. The last class interval = 50-60

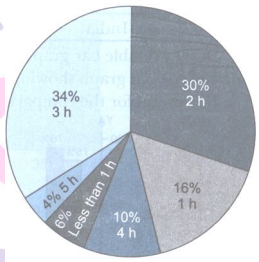
iii. The upper limit = 60 The frequency of the third class (30-40) = 4

iv. The class interval having frequency 10 = 20-30

v. The interval having lowest frequency = 30-40

vi. The class size = upper class limit - lower class limit = 20 - 10 = 10

2. Given below is a pie chart showing the time spend by a group of 350 children in different games. Observe it and answer the questions that follow. [NCERT Exemplar]



(i) How many children spend at least one hour in playing games?

(ii) How many children spend more than 2 hours in playing games?

(iii) How many children spend 3 or lesser hours in playing games?

(iv) Which is greater — number of children who spend 2 hours or more per day or number of children who play for less than one hour?

Sol. (i) Total percentage of children who spend at least one hour in playing games

= 16% + 30% + 34% + 10% + 4% = 94%.

Number of children who spend at least one hour in playing games

= 94% of 350 = $\frac{94}{100}$ x 350 = 329

(ii) Total percentage of children who spend more than 2 hours in playing games

= 34% + 10% + 4% = 48%

Number of children who spend more than 2 hours in playing games

= 48% of 350 = $\frac{48}{100}$ x 350 = 168

(iii) Total percentage of children who spend 3 or less hours in playing games

= 34% + 30% + 16% + 6% = 86%

Number of children who spend 3 or less hours in playing games

= 86% of 350 = $\frac{86}{100}$ x 350 = 301

(iv) Total percentage of children who spend 2 hours or more per day

= 30% + 34% + 10% + 4% = 78%

Number of children who play 2 hours or more per day

= 78% of 350 = $\frac{78}{100}$ x 350 = 273

Number of children who play for less than one hour

= 6% of 350 = $\frac{6}{100}$ x 350 = 21

Therefore, number of children who play for 2 hours or more per day is greater.

3. The pie chart below shows the result of a survey carried out to find the modes of travel used by the children to go to school. Study the pie chart and answer the questions that follow. **[NCERT Exemplar]**

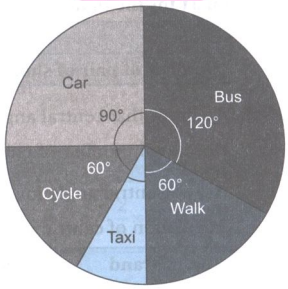
(i) What is the most common mode of transport?

(ii) What fraction of children travel by car?

(iii) If 18 children travel by car, how many children took part in the survey?

(iv) How many children use taxi to travel to school?

(v) By which two modes of transport are equal number of children travelling?



Sol. (i) The most common mode of transport is Bus. 90°

(ii) Fraction of children travel by car = 360° = 4

(iii) 90° represent 18 children 18 360° represents = 90 x 360 = 72 Hence, number of children who took part in the survey are 72

(iv) Central angle for taxi = 360° - (60° + 120° + 90° + 60°) = 360° - 330° = 30° 30 Number of children who use taxi = 360 x 72 = 6

(v) Cycle and walk are the mode that equal number of children are using.

4. A dice is rolled once. What is the probability that the number on top will be

(i) Odd (ii) Greater than 5 **[NCERT Exemplar]**

(iii) A multiple of 3 (iv) Less than 1

(v) A factor of 36 (vi) A factor of 6

Sol. On rolling a die, all possible outcomes are 1, 2, 3, 4, 5, 6

Total number of possible outcomes = 6

(i) Odd number on the top of a die = 1, 3, 5

∴ Number of favourable outcomes = 3

$$P(\text{getting odd number on the top}) = \frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}}$$

$$= \frac{3}{6} - \frac{1}{2}$$

(ii) Number of favourable outcome = 1 (6 only)

∴ Required probability = $\frac{1}{6}$

(iii) Number of favourable outcomes = 2 i.e, 3 and 6

Required probability $\frac{2}{6} = \frac{1}{3}$

(iv) Number of favourable outcome = 0

∴ P(getting number less than 1) = $\frac{0}{6} = 0$

(v) Number on top that are factor of 36 = 1, 2, 3, 4, 6

Number of favourable outcomes = $\frac{5}{6}$

P(a factor of 36) = $\frac{4}{6}$ $or \frac{2}{3}$

(vi) A factor of 6 = 1, 2, 3, 6

Number of favourable outcomes = 4

P(a factor of 6) = $\frac{4}{6}$ $or \frac{2}{3}$.

5. Shoes of the following brands are sold in Nov. 2007 at a shoe store. Construct a Pie chart for the data. **[NCERT Exemplar]**

Brand	A	B	C	D	E
Number of pair of shoes sold	130	120	90	40	20

Sol. We know that central angle for a sector = $\frac{\text{Value of the component}}{\text{Total Value}}$ x 360°

Here total number of pair of shoes = 400

Central angle for a brand = $\frac{\text{Number of shoes sold in brand}}{\text{Total Number of shoes sold}}$ x 360°

Calculation of central angles:

Brand	Number of pair of shoes sold	In Fractions	Central angle
A	130	$\frac{130}{400} = \frac{13}{40}$	$\frac{13}{40} \times 360° = 117$
B	120	$\frac{120}{400} = \frac{3}{10}$	$\frac{3}{10} \times 360° = 108°$
C	90	$\frac{90}{400} = \frac{9}{40}$	$\frac{9}{40} \times 360° = 81°$
D	40	$\frac{40}{400} = \frac{1}{10}$	$\frac{1}{10} \times 360° = 36°$
E	20	$\frac{20}{400} = \frac{1}{20}$	$\frac{1}{20} \times 360° = 18°$

Construction of pie chart

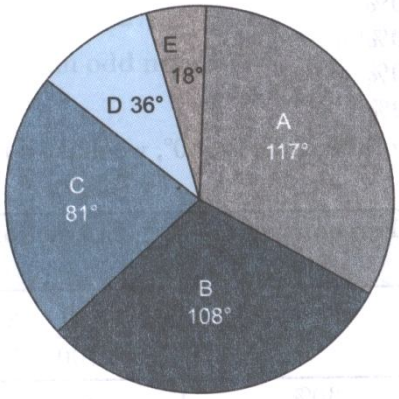
Steps of Construction

(i) Draw a circle with any convenient radius.

(ii) The angle of the sector for A is 117°.

(iii) Continue drawing the remaining central angles.

(iv) Shade the sectors so obtained with different design and label each of them.



6. For the development of basic infrastructure in a district, a project of Z108 crore approved by Development Bank is as follows:

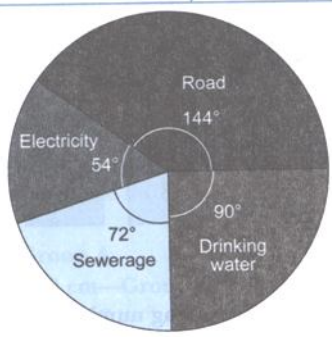
Item Head	Road	Electricity	Drinking water	Sewerage
Amount in crore (`)	43.2	16.2	27.00	21.6

Draw a pie chart for this data.

Sol. Central angle for an item $= \frac{Amount\ approved\ for\ an\ item}{Total\ amount} \times 360^0$

Calculation of pie chart

Items	Amount in crore (₹)	In Fractions	Central angle
Road	43.2	$\frac{43.2}{108} = \frac{2}{5}$	$\frac{2}{5} \times 360° = 144°$
Electricity	16.2	$\frac{16.2}{108} = \frac{3}{20}$	$\frac{3}{20} \times 360° = 54°$
Drinking water	27.00	$\frac{27}{108} = \frac{1}{4}$	$\frac{1}{4} \times 360° = 90°$
Sewerage	21.6	$\frac{21.6}{108} = \frac{1}{5}$	$\frac{1}{5} \times 360° = 72°$



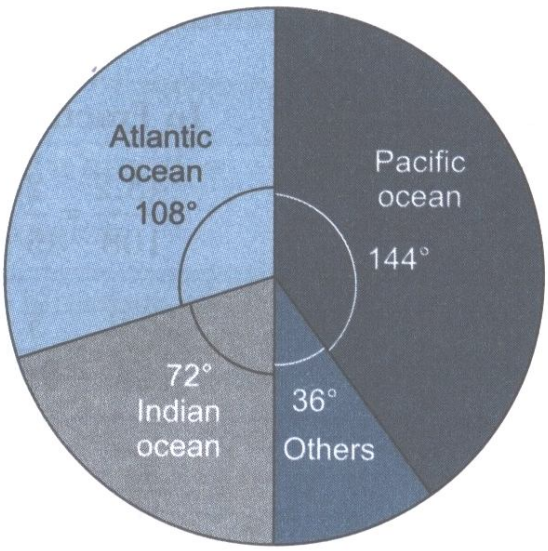
7. The following data represents the approximate percentage of water in various oceans. Prepare a pie chart for the given data. **[NCERT Exemplar]**

Pacific	40%
Atlantic	30%
Indian	20%
Others	10%

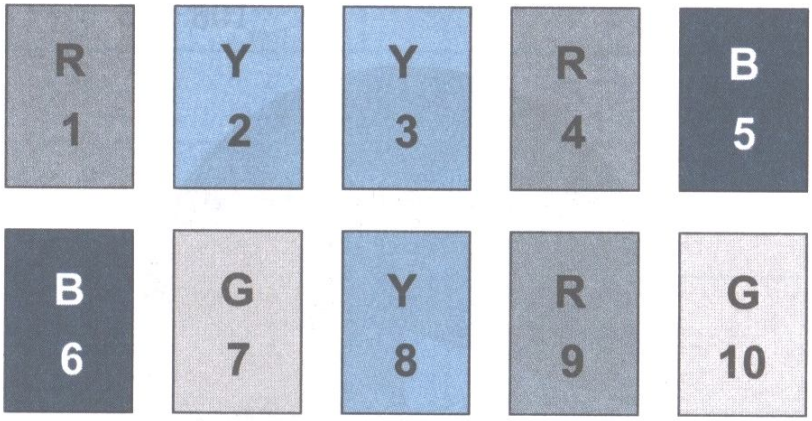
Sol. Total angle at the centre of the circle is 360°, we make a table to find the central angle of the sectors.

Oceans	Percentage of water	In Fractions	Central angle
Pacific	40%	$\frac{40}{100}=\frac{2}{5}$	$\frac{2}{5}\times 360^\circ = 144^\circ$
Atlantic	30%	$\frac{30}{100}=\frac{3}{10}$	$\frac{3}{10}\times 360^\circ = 108^\circ$
Indian	20%	$\frac{20}{100}=\frac{1}{5}$	$\frac{1}{5}\times 360^\circ = 72^\circ$
Others	10%	$\frac{10}{100}=\frac{1}{10}$	$\frac{1}{10}\times 360^\circ = 36^\circ$

The pie chart is drawn as follows:



8. Sonia picks up a card from the given cards. **[NCERT Exemplar]**



Calculate the probability of getting

(i) an odd number (ii) a Y card

(iii) a G card (iv) B card bearing number > 7

Sol. (i) Odd number in the given cards are 1, 3, 5, 7 and 9

Number of favourable outcomes = 5

Total number of outcomes = 10

Probability of getting an odd number $= \frac{Number\ of\ favourable\ outcomes}{\text{Total number of outcomes}}$

$= \frac{5}{10} = \frac{1}{2}$

(ii) The Y cards are 2, 3, and 8

$\therefore$ Number of favourable outcomes = 3

Total number of outcomes = 10

P(getting a Y card) $= \frac{3}{10}$

(iii) The G cards are 7 and 10.

$\therefore$ Number of favourable outcomes = 2

Total number of outcomes = 10

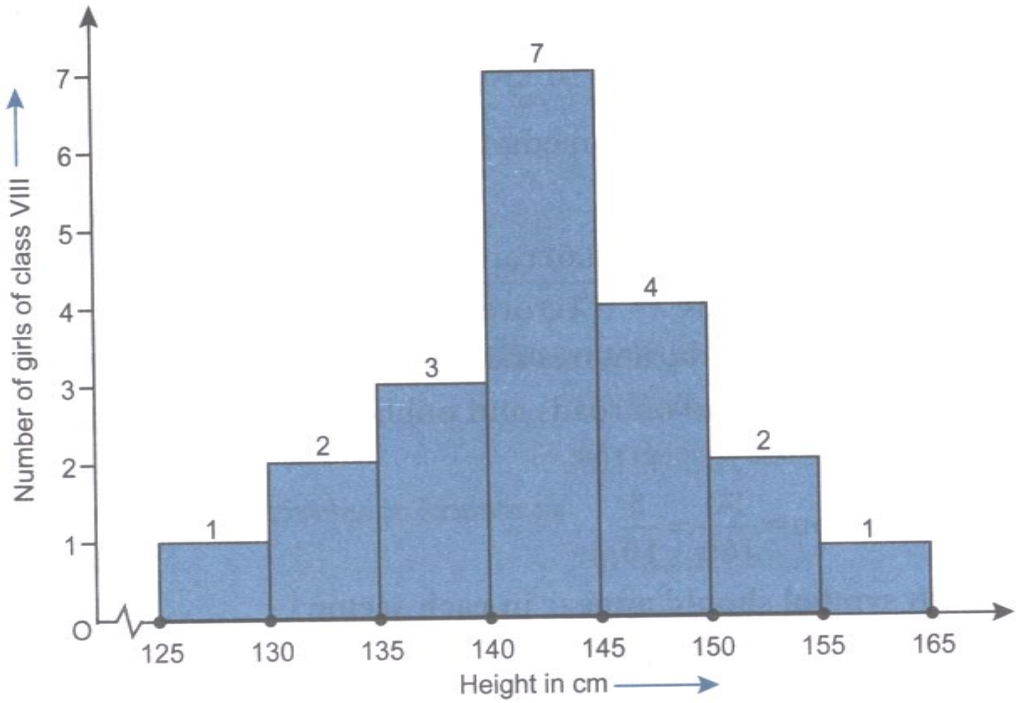
P(getting a G card) $= \frac{2}{10} = \frac{1}{5}$

(iv) B card bearing number > 7 is zero.

$\therefore$ Favourable number of outcomes = 0

P(getting B card bearing number > 7) $= \frac{0}{10} = 0$

9. Observe the histogram figure and answer the questions given below:



i. What information is being given by the histogram?

ii. Which group contains maximum girls?

iii. How many girls have a height of 145 cm and more?

iv. If we divide the girls into the following three categories, how many would there be in each?

150 cm and more—Group A

140 cm to less than 150 cm—Group B

Less than 140 cm—Group C

Sol. i. The above histogram represents the height (in cm) of girls of Class VIII.

ii. The group 140 - 145 contains maximum number of girls (which has as much as 7 girls).

iii. 7 girls (= 4 + 2 + 1) have a height of 145 cm and more.

iv. Number of girls in

Group A : 150 cm and more = 2 + 1 = 3 girls

Group B : 140 cm to less than 150 cm = 7 + 4 = 11 girls

Group C : Less than 140 cm = 1 + 2 + 3 = 6 girls

I. High Order Thinking Skills [HOTS] Questions.

1. It is known that a box of 100 electric bulbs contains 8 defective bulbs. One bulb is taken out at random from the box. What is the probability that the bulb drawn is :

[NCERT Exemplar]

(a) defective

(b) non-defective. Sol. Since,

Total no. of outcomes = 100 (bulbs)

Total no. of defective bulbs = 8

Then, Total no. of non-defective bulbs = 100 - 8 = 92

We know that,

∴ Probability of an event, P(E)

$$= \frac{\text{Favourable outcomes}}{\text{Total number of outcomes}}$$

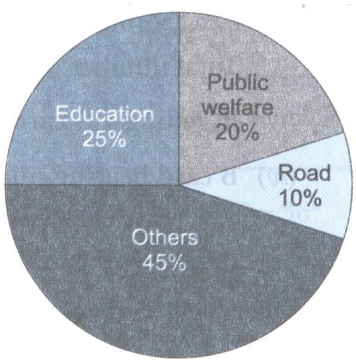
Therefore,

(a) P (defective bulbs) = $\frac{8}{100} = \frac{2}{25}$

(b) P (non-defective bulbs) = $\frac{92}{100} = \frac{23}{25}$

II. High Order Thinking Skills [HOTS] Questions.

1. The following pie chart depicts the expenditure of a state government under different heads.



i. If the total spending is 10 crores, how much money was spent on roads?

ii. How many times is the amount of money spent on education compared to the amount spent on roads?

iii. What fraction of the total expenditure is spent on both roads and public welfare together?

Sol. i. Total expenditure = 10 crores

Money spent on roads = 10% of 10 croroes

$$= \frac{10}{100} \times 10\ crores = 1\ crore$$

ii. The amount of money spent on education = 25% of 10 crores

$$= \frac{25}{100} \times 10 = 2.5\ crores$$

$$\frac{Money\ spent\ on\ education}{Money\ spent\ on\ roads} = \frac{2.5\ crores}{1\ crore} = 2.5$$

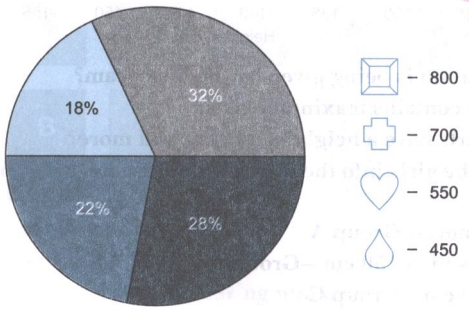
∴ Money spent on education is 2.5 times Money spent on roads.

iii. Total expenditure spend on roads and public welfare together.

= 20% + 10%

Required fraction = $\frac{30}{100} = \frac{3}{10}$

2. Identify which symbol should appear in each section. [NCERT Exemplar]



Sol. Total value 800 + 700 + 550 + 450 = 2500

32% represents $\frac{32}{100}$ × 2500 = 800

Therefore, 32% represents the symbol

28% represents $\frac{28}{100}$ × 2500 = 700

Therefore 28% represents the symbol

22% represent $\frac{22}{100}$ × 2500 = 550

Therefore 22% represents the symbol

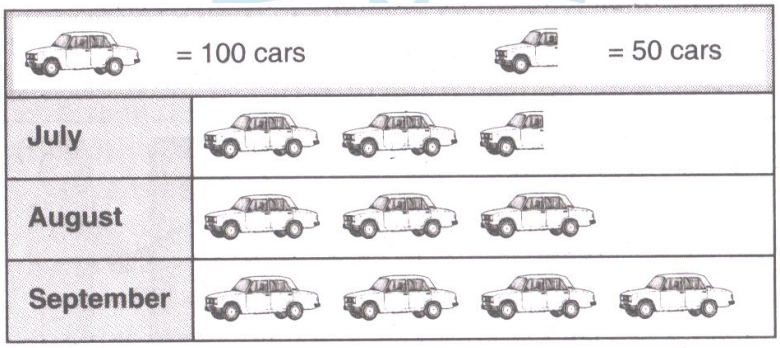
18% represents $\frac{18}{100}$ × 2500 = 450

Therefore 18% represents the symbol

I. Value Based Questions.

1. (a) In a lottery, there are 10 prizes and 20 blanks. A ticket is chosen at random, what is the probability of getting a prize ?

(b) Study the following pictograph and answer the questions given below it.



(a) How many cars were produced in the month of July ?

(b) In which month were maximum number of cars produced ?

Sol. (a) Since, total no. of outcomes = 10 + 20 = 30

∴ Probability of an event,

$P(E) = \frac{\text{Favourable outcomes}}{\text{Favourable outcomes}}$

Then, P(getting a prize) = $\frac{10}{30} = \frac{1}{3}$

(a) 250 cars were produced in the month of July.

(b) Maximum number (= 400) of cars were produced in the month of September.