UNIT 2

DATA HANDLING

(A) Main Concepts and Results

- The information collected in term of numbers is called **data**.
- Data are represented graphically to have a quick glance on them.
- Data available in an unorganised form are called **raw data**.
- The number of times a particular observation occurs in a given data is called its **frequency.**
- When the data are large, they can be arranged in groups and each group is known as **Class Interval or Class.**
- A table showing the frequencies of various observations or class intervals of a given data is called a **Frequency Distribution table.**
- The *upper value* of a class interval is called its **Upper Class Limit** and the *lower value* of the class interval is called its **Lower Class Limit**.
- The difference between the upper class limit and lower class limit of a class is called the **Width or Size** of the class.
- The difference between the lowest and the highest observation in a given data is called its **Range**.
- Grouped data can be represented by a **histogram**.
- Histogram is a type of bar diagram, where the class intervals are shown on the horizontal axis and the heights of the bars (rectangles) show the frequency of the class interval, but there is no gap between the bars as there is no gap between the class intervals.
- Data can also be represented using a **pie chart** (circle graph). It shows the relationship between a whole and its parts.

- There are certain experiments whose outcomes have an equal chance of occurring. Such outcomes are said to be **equally likely.**
- Probability of an event =

$$\frac{\text{Number of outcomes that make an event}}{\text{Total number of outcomes of the experiment}},$$

when the outcomes are equally likely.

(B) Solved Examples

In examples 1 to 6, there are four options given out of which one is correct. Choose the correct answer.

Example 1 : The range of the data– 9, 8, 4, 3, 2, 1, 6, 4, 8, 10, 12, 15, 4, 3 is

(a) 15 (b) 14 (c) 12 (d) 10

Solution : The correct answer is (b).

Example 2 : The following data : 2, 5, 15, 25, 20, 12, 8, 7, 6, 16, 21, 17, 30, 32, 23, 40, 51, 15, 2, 9, 57, 19, 25 is grouped in the classes 0 –5, 5 –10, 10 –15 etc. Find the frequency of the class 20 –25.

(a) 5 (b) 4 (c) 3 (d) 2

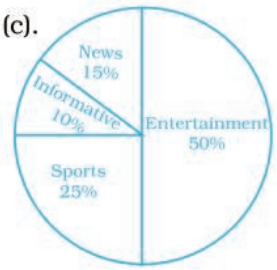
Solution : The correct answer is (c).

Example 3 : The pie chart depicts the information of viewers watching different type of channels on TV. Which type of programmes are viewed the most?

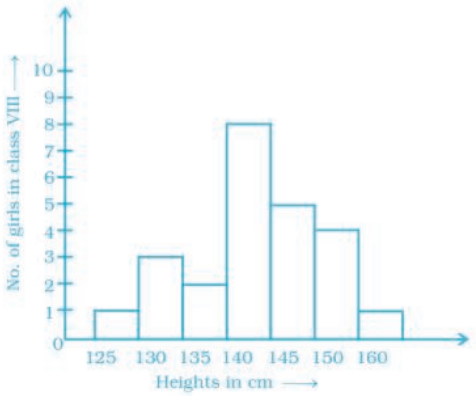
(a) News (b) Sports (c) Entertainment

(d) Informative.

Solution : The correct answer is (c).



Example 4 :



Observe the histogram given above. The number of girls having height 145 cm and above is

(a) 5 (b) 10 (c) 17 (d) 19

Solution : The correct answer is (b).

Example 5 : A dice is thrown two times and sum of the numbers appearing on the dice are noted. The number of possible outcomes is

(a) 6 (b) 11 (c) 18 (d) 36

Solution : The correct answer is (b).

[Possible sums are 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12].

Example 6 : The probability of getting a multiple of 2 when a dice is rolled is

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{2}{3}$

Solution : The correct answer is (c).

In examples 7 to 9 fill in the blanks to make statements true.

Example 7 : The fourth class interval for a grouped data whose first and second class intervals are 10 –15 and 15 –20 respectively is _____.

Solution : 25 – 30

Example 8 : In the class interval 250 – 275, 250 is known as the _____.

Solution : Lower class limit.

Example 9 : The number of times a particular observation occurs in the given data is called its _____.

Solution : Frequency.

In examples 10 to 12, state whether the statements are true (T) or false (F).

Example 10 : The central angle of the sectors in a pie chart will be a fraction of 360°.

Solution : True.

Example 11 : On throwing a dice, the probability of occurrence of an odd number is $\frac{1}{2}$.

Solution : True.

Example 12 : A pie chart is also called a pictograph.

Solution : False .

Example 13 : The weekly wages (in Rs.) 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 marks, make a frequency distribution table with class intervals 800 – 810, 810 – 820 and so on.

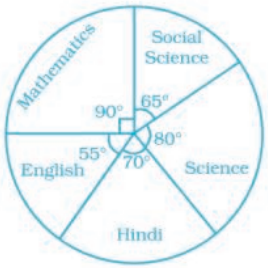
Solution :

Class interval	Tally marks	Frequency
800 – 810	III	3
810 – 820	II	2
820 – 830	I	1
830 – 840	𝍸 IIII	9
840 – 850	𝍸	5
850 – 860	I	1
860 – 870	III	3
870 – 880	I	1
880 – 890	I	1
890 – 900	IIII	4
	Total	**30**

Example 14 : The pie chart gives the marks scored in an examination by a student in different subjects. If the total marks obtained were 540, answer the following questions–

(i) In which subject did the student score 105 marks?

(ii) How many more marks were obtained by the student in Mathematics than in Hindi?



Solution : (i) For 540 marks, central angle = 360°

For 1 mark, central angle = $\frac{360°}{540}$

For 105 marks, central angle = $\frac{360°}{540} \times 105$

$= 70°$

Hence the student scored 105 marks in Hindi.

(ii) Central angle = 360° for 540 marks,

For 1 mark, central angle = $\frac{360°}{540}$

For 90 marks, central angle = $\frac{540}{360} \times 90$ marks

$= 135$ marks.

Thus, the student gets 135 marks in Mathematics. From part (i) we get that the student gets 105 marks in Hindi.

Difference in marks = 135 – 105 = 30

Hence, the student gets 30 more marks in Mathematics than in Hindi.

Example 15 : Draw a pie chart for the given data.

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

Solution : 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	$\frac{30}{120}=\frac{1}{4}$	$\frac{1}{4}\times 360°=90°$
South Indian	40	$\frac{40}{120}=\frac{1}{3}$	$\frac{1}{3}\times 360°=120°$
Chinese	25	$\frac{25}{120}=\frac{5}{24}$	$\frac{5}{24}\times 360°=75°$
Others	25	$\frac{25}{120}=\frac{5}{24}$	$\frac{5}{24}\times 360°=75°$

The pie chart is drawn adjacently.



Try to write a formula for the probability of finding a paper.

Data can be represented in several different ways, depending on the type of data and the message to be conveyed.

Type of Graph	
Line graph	Shows change in data over time.
Bar graph	Shows relationship or comparisons between groups.
Cricle graph	Compares parts to a whole.
Histogram	Shows the frequency of data divided into equal groups.

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Example 16 : Draw a histogram for the frequency distribution table given in Example 13 and answer the following questions.

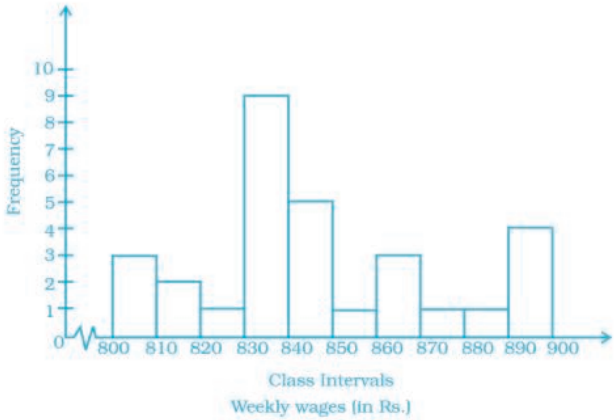
(i) Which class interval has the maximum number of workers?

(ii) How many workers earn Rs. 850 and more?

(iii) How many workers earn less than Rs. 850?

(iv) How many workers earn Rs. 820 or more but less than Rs. 880?

Solution :



(i) 830 – 840

(ii) 10

(iii) 20

(iv) 20

Example 17 : Read the frequency distribution table given below and answer the questions that follow:

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**

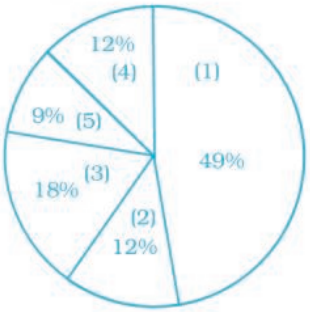
(i) Class interval which has the lowest frequency.
(ii) Class interval which has the highest frequency.
(iii) What is the class size of the intervals?
(iv) What is the upper limit of the fifth class?
(v) What is the lower limit of the last class?

Solution : (i) 65 – 75
(ii) 75 – 85
(iii) 10
(iv) 75
(v) 85

Example 18 : Application on problem solving strategy

Given below is a pie chart depicting the reason given by people who had injured their lower back.

Study the pie chart and find the number of people who injured their back while either bending and lifting. A total of 600 people were surveyed.



Solution : **Understand and explore the problem**

- What information is given in the question?
  The percentages of the most common reasons given by 600 people.
- What are you trying to find?
  The total number of people out of 600 who have injured their back while bending and lifting.
- Is there any information that is not needed?
  The percentages of other reasons except bending and lifting are not required.

Plan a strategy

- You have learnt to solve questions dealing with percentages in earlier classes. Use the same method to solve this question.

- 18% have injured their back while bending and
  49% have injured their back while lifting so–

To find

The total number of people can be found by finding (18% + 49%) = 67% of 600.

Solve

Total percentage of people who injured their back while bending and lifting = 18% +49% = 67%.

Number of people who injured their back while bending and lifting = 67% of 600

$$= \frac{67}{100} \times 600$$

$$= 402$$

Hence, 402 people injured their back while bending and lifting.

Revise

You can check the answer by finding the total number of people who injured their backs for reasons other than bending and lifting and then subtracting the answer from the total number of people.

Total percentage of people who injured their backs for reasons other than bending and lifting = 12% +12% + 9%

$$= 33\%$$

Number of such people = 33% of 600 $= \frac{33}{100} \times 600$

$$= 198$$

So, 600 –198 should give us the answer for our original question, and 600 –198 = 402 which is same as our answer. Hence our answer is correct.

Think and Discuss

(i) If the total angle covered by all sectors is 360^0, find the angle covered by the sector representing the people who injured their back by pulling only.

(ii) If the number of people surveyed is doubled, would the number of people who injured their back by bending and lifting also be doubled?

(C) Exercise

In questions 1 to 35 there are four options given, out of which one is correct. Choose the correct answer.

1. The height of a rectangle in a histogram shows the

(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

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

3. In a pie chart, the total angle at the centre of the circle is

(a) 180° (b) 360° (c) 270° (d) 90°

4. The range of the data 30, 61, 55, 56, 60, 20, 26, 46, 28, 56 is

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

5. Which of the following is not a random experiment?

(a) Tossing a coin (b) Rolling a dice

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

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

6. What is the probability of choosing a vowel from the alphabets?

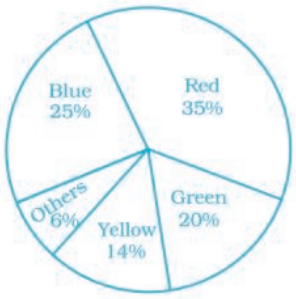
(a) $\frac{21}{26}$ (b) $\frac{5}{26}$ (c) $\frac{1}{26}$ (d) $\frac{3}{26}$

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?

(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?

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

(d) Yellow

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

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

10. Which of the following is a reasonable conclusion for the given data?

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

(b) Green is the least 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, 0, 3, 2, 0, 1, 5, 4, 4

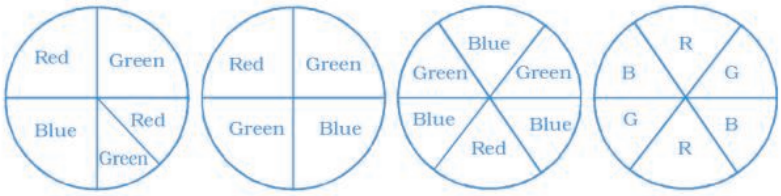
What is the range of the data?

(a) 8 (b) 13°C (c) 10°C (d) 12°C

12. 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?

(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?



(i) (ii) (iii) (iv)

(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

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

15. A coin is tossed 200 times and head appeared 120 times. The probability of getting a head in this experiment is

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

16. Data collected in a survey shows that 40% of the buyers are interested in buying a particular brand of toothpaste. The central angle of the sector of the pie chart representing this information is

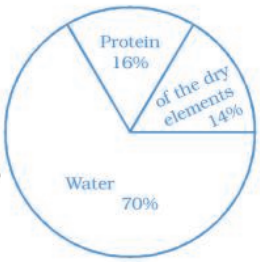
(a) 120° (b) 150° (c) 144° (d) 40°

17. Monthly salary of a person is Rs. 15000. The central angle of the sector representing his expenses on food and house rent on a pie chart is 60°. The amount he spends on food and house rent is

(a) Rs. 5000 (b) Rs. 2500 (c) Rs. 6000 (d) Rs. 9000

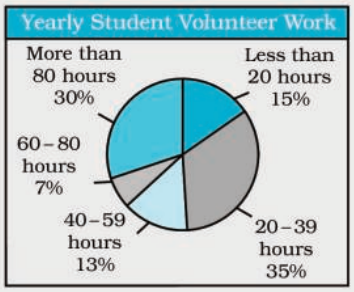
18. The following pie chart gives the distribution of constituents in the human body. The central angle of the sector showing the distribution of protein and other constituents is

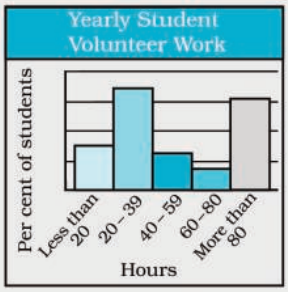
(a) 108° (b) 54° (c) 30° (d) 216°



Selecting a Data Display

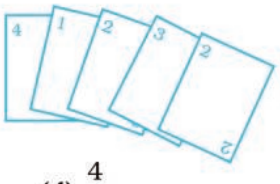
Which graph is a better display of the data on students volunteering for some work?





The data shows how groups of people who responded to the survey compare to the whole. The circle graph is the better representation.

19. Rohan and Shalu are playing with 5 cards as shown in the figure. What is the probability of Rohan picking a card without seeing, that has the number 2 on it?



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

20. The following pie chart represents the distribution of proteins in parts of a human body. What is the ratio of distribution of proteins in the muscles to that of proteins in the bones?



(a) 3 : 1 (b) 1 : 2 (c) 1 : 3 (d) 2 : 1

21. What is the central angle of the sector (in the above pie chart) representing skin and bones together?

(a) 36° (b) 60° (c) 90° (d) 96°

22. What is the central angle of the sector (in the above pie chart) representing hormones enzymes and other proteins.

(a) 120° (b) 144° (c) 156° (d) 176°

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



The chance of occurrence of Head is

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

24. Total number of outcomes, when a ball is drawn from a bag which contains 3 red, 5 black and 4 blue balls is

(a) 8 (b) 7 (c) 9 (d) 12

25. A graph showing two sets of data simultaneously is known as

(a) Pictograph (b) Histogram (c) Pie chart (d) Double bar graph

26. Size of the class 150 –175 is

(a) 150 (b) 175 (c) 25 (d) –25

27. In a throw of a dice, the probability of getting the number 7 is

(a) $\frac{1}{2}$ (b) $\frac{1}{6}$ (c) 1 (d) 0

28. Data represented using circles is known as

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

29. Tally marks are used to find

(a) Class intervals (b) Range

(c) Frequency (d) Upper limit

30. Upper limit of class interval 75 –85 is

(a) 10 (b) –10 (c) 75 (d) 85

31. Numbers 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?

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

32. 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?



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

33. A coin is tossed two times. The number of possible outcomes is

(a) 1 (b) 2 (c) 3 (d) 4

34. A coin is tossed three times. The number of possible outcomes is

(a) 3 (b) 4 (c) 6 (d) 8

35. A diece is tossed two times. The number of possible outcomes is

(a) 12 (b) 24 (c) 36 (d) 30

In questions 36 to 58, fill in the blanks to make the statements true.

36. Data available in an unorganised form is called _____ data.

37. In the class interval 20 – 30, the lower class limit is _____.

38. In the class interval 26 – 33, 33 is known as _____.

39. The range of the data 6, 8, 16, 22, 8, 20, 7, 25 is _____.

40. A pie chart is used to compare _____ to a whole.

41. In the experiment of tossing a coin one time, the outcome is either _____ or _____.

42. When a dice is rolled, the six possible outcomes are _____.

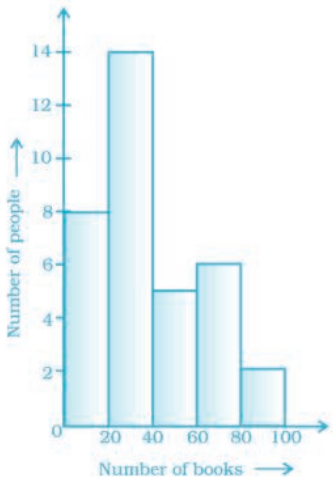
43. Each outcome or a collection of outcomes in an experiment makes an _____.

44. An experiment whose outcomes cannot be predicted exactly in advance is called a _____ experiment.

45. The difference between the upper and lower limit of a class interval is called the _____ of the class interval.

46. The sixth class interval for a grouped data whose first two class intervals are 10 – 15 and 15 – 20 is _____.

Histogram given on the right shows the number of people owning the different number of books. Answer 47 to 50 based on it.



47. The total number of people surveyed is _____.

48. The number of people owning books more than 60 is _____.

49. The number of people owning books less than 40 is _____.

50. The number of people having books more than 20 and less than 40 is _____.

51. The number of times a particular observation occurs in a given data is called its _____.

52. When the number of observations is large, the observations are usually organised in groups of equal width called _____.

53. The total number of outcomes when a coin is tossed is _____.

54. The class size of the interval 80 – 85 is _____.

55. In a histogram _____ are drawn with width equal to a class interval without leaving any gap in between.

56. When a dice is thrown, outcomes 1, 2, 3, 4, 5, 6 are equally _____.

57. In a histogram, class intervals and frequencies are taken along _____ axis and _____ axis.

58. In the class intervals 10 –20, 20 –30, etc., respectively, 20 lies in the class _____.

In questions 59 to 81, state whether the statements are true (T) or false (F).

59. In a pie chart a whole circle is divided into sectors.

60. The central angle of a sector in a pie chart cannot be more than 180°.

61. Sum of all the central angles in a pie chart is 360°.

62. In a pie chart two central angles can be of 180°.

63. In a pie chart two or more central angles can be equal.

64. Getting a prime number on throwing a die is an event.

Using the following frequency table, answer question 65-68

Marks (obtained out of 10)	4	5	7	8	9	10
Frequency	5	10	8	6	12	9

65. 9 students got full marks.

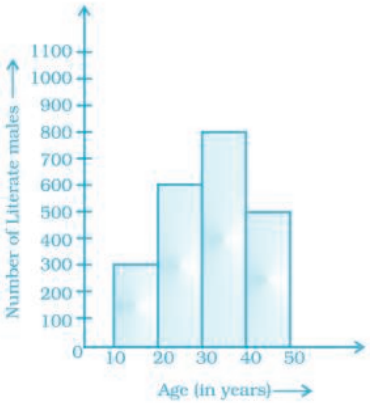
66. The frequency of less than 8 marks is 29.

67. The frequency of more than 8 marks is 21.

68. 10 marks the highest frequency.

69. If the fifth class interval is 60 – 65, fourth class interval is 55 – 60, then the first class interval is 45 –50.

70. From the histogram given on the right, we can say that 1500 males above the age of 20 are literate.



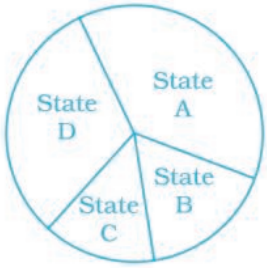
71. The class size of the class interval 60 – 68 is 8.

72. If a pair of coins is tossed, then the number of outcomes are 2.

73. On throwing a dice once, the probability of occurence of an even number is $\frac{1}{2}$.

74. On throwing a dice once, the probability of occurence of a composite number is $\frac{1}{2}$.

75. From the given pie chart, we can infer that production of Manganese is least in state B.



Production of Manganese in 4 different states

76. One or more outcomes of an experiment make an event.

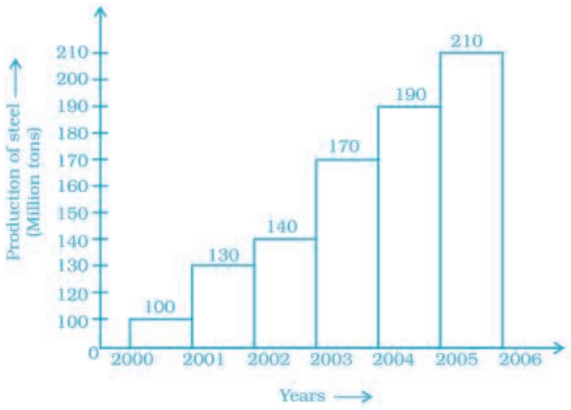
77. The probability of getting number 6 in a throw of a dice is $\frac{1}{6}$. Similarly the probability of getting a number 5 is $\frac{1}{5}$.

78. The probability of getting a prime number is the same as that of a composite number in a throw of a dice.

79. In a throw of a dice, the probability of getting an even number is the same as that of getting an odd number.

80. To verify pythagoras theorem is a random experiment.

81. The following pictorial representation of data is a histogram.



82. 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?

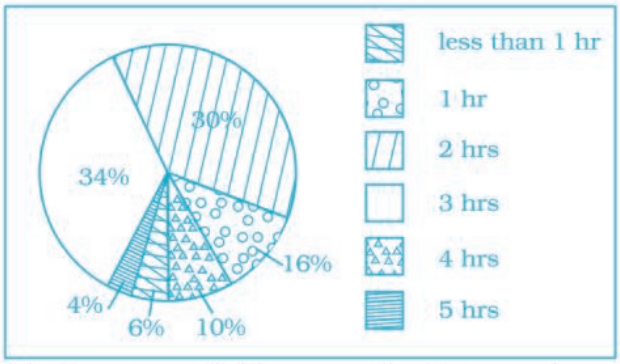
(e) Which interval has the lowest frequency?

(f) What is the class size?

83. The top speeds of thirty different land animals have been organised into a frequency table. Draw a histogram for the given data.

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

84. 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 thatfollow.



(a) How many children spend at least 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?

85. The pie chart on the right 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.



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

(b) What fraction of children travel by car?

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

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

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

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

(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

87. Classify the following statements under appropriate headings.

(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.

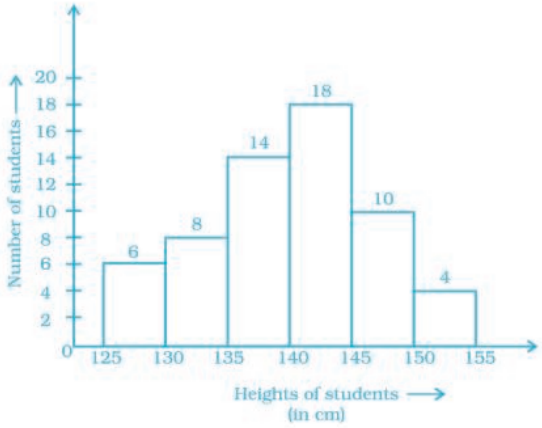
(f) Winning a racing competition by you.

Certain to happen	Impossible to happen	May or may not happen

88. Study the pie chart given below depicting the marks scored by a student in an examination out of 540. Find the marks obtained by him in each subject.

89. 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 bag is 36, find the number of yellow balls.

90. Look at the histogram below and answer the questions that follow.



(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?

91. 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.

92. Draw a histogram to represent the frequency distribution in question 91.

93. 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).

94. Prepare a histogram from the frequency distribution table obtained in question 93.

95. The weights (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.

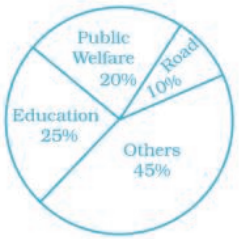
(i) Which class has the least frequency?

(ii) Which class has the maximum frequency?

96. Shoes of the following brands are sold in Nov. 2007 at a shoe store. Construct a pie chart for the data.

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

97. 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?

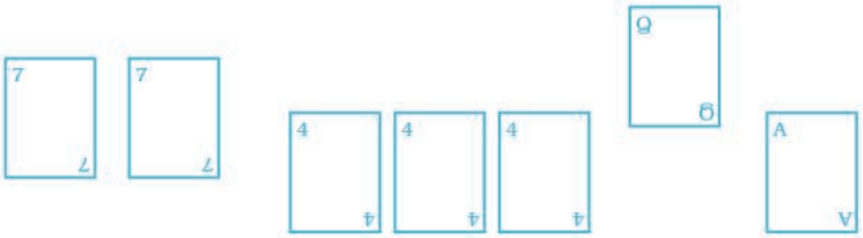
98. The following data represents the different number of animals in a zoo. Prepare a pie chart for the given data.

Animals	Number of animals
Deer	42
Elephant	15
Giraffe	26
Reptiles	24
Tiger	13

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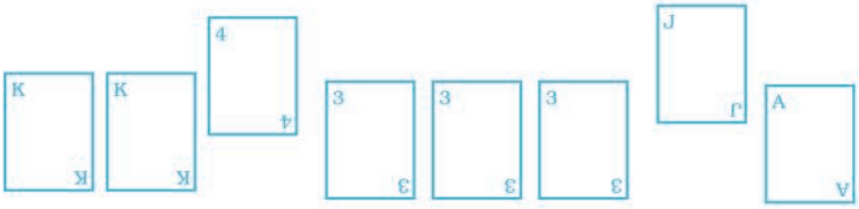
99. Playing cards

(a) From a pack of cards the following cards are kept face down:



Suhail wins if he picks up a face card. Find the probability of Suhail winning?

(b) Now the following cards are added to the above cards:



What is the probability of Suhail winning now? Reshma wins if she picks up a 4. What is the probability of Reshma winning?

[Queen, King and Jack cards are called face cards.]

100. 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.

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

(b) Which weight group has the highest frequency?

101. Complete the following table:

Weights (in kg.)	Tally Marks	Frequency (Number of persons)
40 – 50	𝍸 𝍸 II	
50 – 60	𝍸 𝍸 IIII	
60 – 70	𝍸 I	
70 – 80	II	
80 – 90	I	

Find the total number of persons whose weights are given in the above table.

102. Draw a histogram for the following data.

Class interval	10–15	15–20	20–25	25–30	30–35	35–40
Frequency	30	98	80	58	29	50

103. 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 intervals as 50–100.

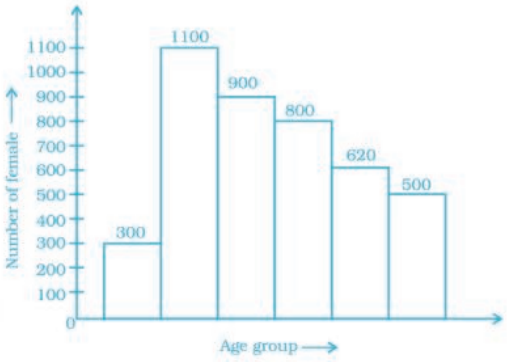
104. The below histogram shows the number of literate females in the age group of 10 to 40 years in a town.

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

(b) What is the classes width?

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

(d) In which age group is the number of literate females the highest?



105. The following histogram shows the frequency distribution of teaching experiences of 30 teachers in various schools:

(a) What is the class width?

(b) How many teachers are having the maximum teaching experience and how many have the least teaching experience?

(c) How many teachers have teaching experience of 10 to 20 years?

106. In a district, the number of branches of different banks is given below:

Bank	State Bank of India	Bank of Baroda	Punjab National Bank	Canara Bank
Number of Branches	30	17	15	10

Draw a pie chart for this data.

107. For the development of basic infrastructure in a district, a project of Rs 108 crore approved by Development Bank is as follows:

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

Draw a pie chart for this data.

108. In the time table of a school, periods allotted per week to different teaching subjects are given below:

Subject	Hindi	English	Maths	Science	Social Science	Computer	Sanskrit
Periods Allotted	7	8	8	8	7	4	3

Draw a pie chart for this data.

109. A survey was carried out to find the favourite beverage preferred by a certain group of young people. The following pie chart shows the findings of this survey.



From this pie chart answer the following:

(i) Which type of beverage is liked by the maximum number of people.

(ii) If 45 people like tea, how many people were surveyed?

110. The following data represents the approximate percentage of water in various oceans. Prepare a pie chart for the given data.

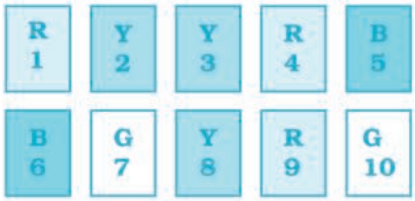
Pacific	40%
Atlantic	30%
Indian	20%
Others	10%

111. At a Birthday Party, the children spin a wheel to get a gift. Find the probability of



(a) getting a ball
(b) getting a toy car
(c) any toy except a chocolate

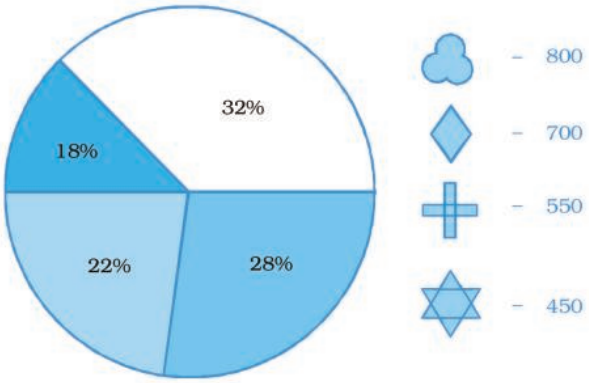
112. Sonia picks up a card from the given cards.



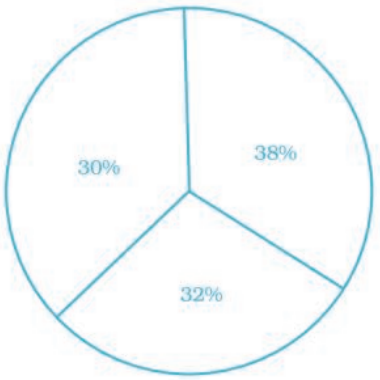
Calculate the probability of getting

(a) an odd number
(b) a Y card
(c) a G card
(d) B card bearing number > 7

113. Identify which symbol should appear in each sector in 113, 114.



114.

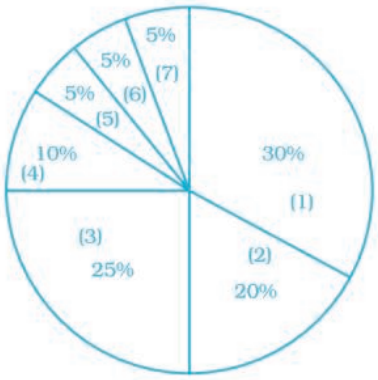


Red Colour – 192

Yellow Colour – 228

Pink Colour – 180

115. A financial counselor gave a client this pie chart describing how to budget his income. If the client brings home Rs. 50,000 each month, how much should he spend in each category?

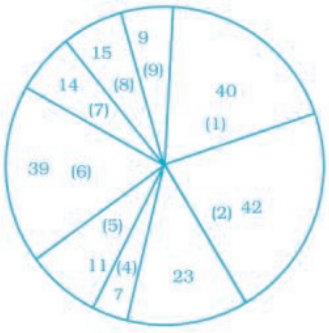


1. Housing
2. Food (including eating out)
3. Car Loan & Maintenance
4. Utilities
5. Phone
6. Clothing
7. Entertainment

116. Following is a pie chart showing the amount spent in rupees (in thousands) by a company on various modes of advertising for a product.

Now answer the following questions.

1. Which type of media advertising is the greatest amount of the total?
2. Which type of media advertising is the least amount of the total?



1. Television
2. Newspapers
3. Magazines
4. Radio
5. Business papers
6. Direct mail
7. Yellow pages
8. Outdoor
9. Miscellaneous

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3. What per cent of the total advertising amount is spent on direct mail campaigns?
4. What per cent of the advertising amount is spent on newspaper and magazine advertisements?
5. What media types do you think are included in miscellaneous? Why aren't those media types given their own category?

(D) Application, Games and Puzzles

1 Card Activity



	Face Cards			Number Cards										
	K	Q	J	10	9	8	7	6	5	4	3	2	A	Total
Spade														
Heart														
Diamond														
Club														
Total														

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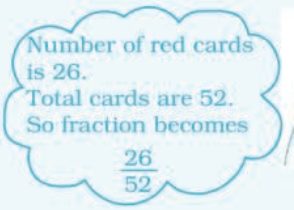






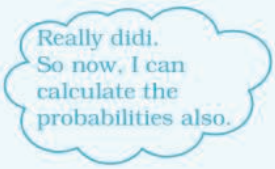
1. How many colours can you observe?
2. How many cards are there in all?
3. How many cards of one type are there?
4. How many types of cards can you observe? Name them.
5. How many black cards are there in all?
6. How many red cards are there in all?
7. How many face cards of each type are there?
8. How many picture cards are there in all?















9. From a pack of well-shuffled cards, what is the probability of getting

(i) a black face card (ii) a red jack iii) a 4 of spade

iv) a picture card (v) a red card of ace (vi) a black king

(vii) an ordinary card (viii) a picture card of heart

(ix) an ace of club (x) a king

(xi) a card of diamond (xii) a black ordinary card

2 Playing with dice

(a) Complete the table given below and answer the questions that follow:

A				B			
Dice 1	Dice 2	Out-comes	Sum	Dice 1	Dice 2	Out-comes	Sum
		(1,1)	2				
		(1,2)	3				
		(1,3)	4				
		(1,4)	5				

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The Paper Chase

Pratibha's desk has 8 drawers. When she receives a paper, she usually chooses a drawer at random to put it in. However, 2 out of 10 times she forgets to put the paper away, and it gets lost.



The probability that a paper will get lost is $\frac{2}{10}$, or $\frac{1}{5}$.

- What is the probability that a paper will be put into a drawer?
- If all drawers are equally likely to be chosen, what is the probability that a paper will be put in drawer 3?

When Pratibha needs a document, she looks first in drawer 1 and then checks each drawer in order until the paper is found or until she has looked in all the drawers.

1. If Pratibha checked drawer 1 and didn't find the paper she was looking for, what is the probability that the paper will be found in one of the remaining 7 drawers?
2. If Pratibha checked drawers 1, 2 and 3, and didn't find the paper she was looking for, what is the probability that the paper will be found in one of the remaining 5 drawers?
3. If Pratibha checked drawers 1–7 and didn't find the paper she was looking for, what is the probability that the paper will be found in the last drawer?

(b) Complete the table given below.

Sum of dots on both the dice	Tally marks	Number of outcomes	Probability
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Two dice are rolled together, using the above table find the probability of—

(i) sum of digits to be more than 6.

(ii) sum of digits to be less than 3.

(iii) sum of digits to be either 5 or 6.

(iv) sum of digits to be 12.

(v) sum of digits to be less than 9 but more than 5.

3 DATA COLLECTION

Read the paragraph given below and complete the tables given.

All of us have some concept of statistics because magazines, newspapers, radio and TV advertisements are full of statistics or numerical data. Existence of the practice of collecting numerical data in ancient India is evident from the fact that during the reign of Chandragupta Maurya, there was a good system of collecting such data especially with regard to births and deaths. During Akbar's reign, Raja Todarmal, the Land and Revenue Minister, maintained good records of land and agricultural statistics. In Ain-i-Akbari written by Abul Fazal, a detailed account of the administrative and statistical surveys conducted during that period can be found.

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From the paragraph given on the previous page prepare the frequency table of all the letters of the English alphabet and answer the questions that follow.

1. Frequency table for each letter of the alphabet.

Letter	Tally marks	Frequency
A		
B		
C		
-		
-		
-		
Z		

(a) Which is the least frequently occuring letter?

(b) Which vowel is most commonly used?

(c) Which consonant is most commonly used?

(d) Find the ratio of vowels to that of consonants.

2. Frequecy table for words with two or more letters.

Number of words with	Tally marks	Frequency
2 letters		
3 letters		
4 letters		
5 letters		
6 letters		
more than 6 letters		

(a) How many two letter words are used in the paragraph?

(b) How many words are used in all?

(c) How many words have five letters or more?

(d) What is the ratio of three letter words and five letter words?

4 Fun Activity

Take a packet which has different colours of toffees/candies in it. Count the number of toffees of each colour and fill the data in the table given below. Also draw a pie chart to depict the data.

Colour of candies	Number	Fraction	Fraction of 360°
Red			
Green			

5 Conducting Survey

Conduct a class survey to know the favourite T.V. channels and note the responses in the following table.

Channels	Number of Votes	Fraction of Total Votes	Estimated per cent of Total Votes	Caculated per cent of Total Votes
News				
Movies				
History and Nature				
Cartoon				
Sports				

How accurate is your estimation?

Now, take a strip of thick chart paper, 1 cm wide and divide it into equal-sized rectangles – one for each student of your class. The entire strip represents your whole class, or 100% of the votes. On your strip, colour groups of rectangles according to the number of votes each choice received. Use a different colour for each choice. For example, if 5 students voted for movie, colour the first 5 rectangles blue. If 7 choose cartoon, colour the next 7 rectangle green. When you are finished, all the rectangles should be coloured.



Now create a circle graph as shown below.

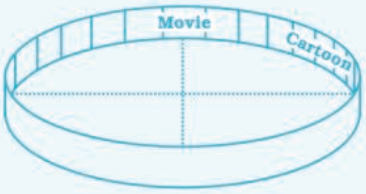
– Tape the ends of your strip together, with no overlap, to form a loop with the coloured rectangles inside.

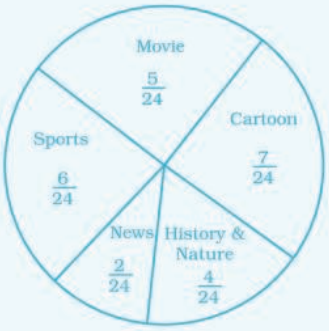
– Tape four copies of the quarter-circle template together to form a circle.



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- Place your above loop around the circle. On the edge of the circle, mark where each colour begins and ends.
- Remove the loop, and use a ruler to connect each mark you made to the centre of the circle.
- Colour the sections of your graph. Label each section with the channels name and the fraction of votes that channel received. For example, your circle graph known as pie chart might look like this.



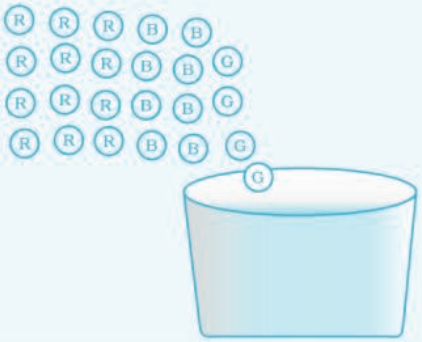


Circle graphs in books, magazines, and newspapers are often labeled with per cents. Add per cent labels to your pie chart.

6 Marble Game

Pramod is babysitting his little sister Monika and her two friends, Puja and Jyoti. Monika is wearing red, Puja is wearing blue and Jyoti is wearing green coloured clothes.

Pramod fills a bucket with 12 red (R) marbles, 8 blue (B) marbles and 4 green (G) marbles. He tells the girls that they will play a game. He will reach into the bucket and pull out a marble at random. The girl whose clothes match the colour of the marble scores 1 point.



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a. What is the probability of each girl scoring 1 point on the first draw?

Monika :

Puja :

Jyoti :

b. What is the probability of not drawing a green marble on the first draw?

c. If two marbles of each colour are added to the bucket, do the probabilities in part (a) change? Explain your answer.

d. If the number of each colour is doubled, do the probabilities in part (a) change? Explain why or why not.

7 Crossword Puzzle

Solve the crossword (given on the next page) and then fill up the given boxes. Clues are given below for across as well as downward filling. Also, for across and down clues, due number is written at the corner of the boxes. Answer of clues have to be filled in their respective boxes.

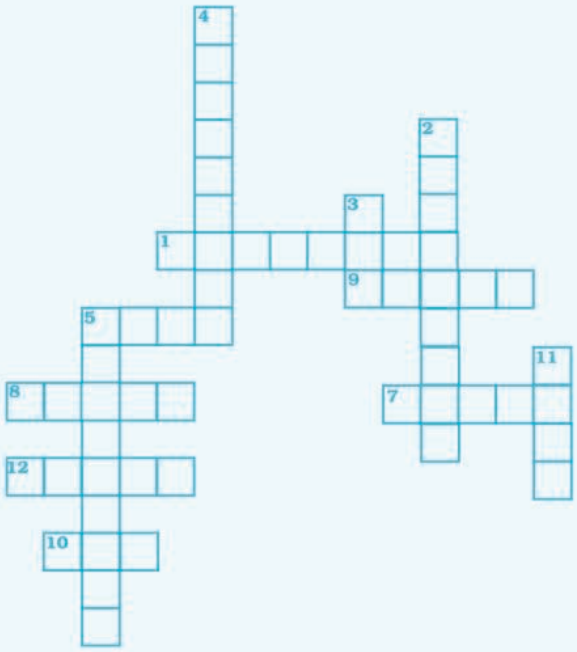
Across

1. Another name for a circle graph is _____.
5. Class width of the interval 10-15 is _____.
7. Difference of highest and lowest observations in a given data is called _____.
8. Each outcome or a collection of outcomes in an experiment is known as _____.
9. Pie chart represents the comparison of parts to a _____.
10. Probability of sun rising in the east is _____.
12. Probability of getting a head or a tail on tossing a coin once is _____.

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Down

2. Representation of grouped data graphically is called _____.
3. Unorganised and ungrouped data are called _____.
4. Difference between upper and lower class limit is known as _____.
6. The number of times a particular observation occurs in the given data is called _____.
11. If today is Saturday, then the probability of two days after tomorrow being a Monday is _____.



Rough Work

Rough Work

Rough Work

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