Unit 2(Data Handling)

Question. 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

Answer. (d) The height of a rectangle in a histogram shows the frequency of the class,

Note The number of times a particular observation occurs in a given data, is called its frequency.

Question. 2 A geometric representation showing the relationship between a whole and its parts, is a

(a) pie chart (b) histogram

(c) bar graph 4 (d) pictograph

Answer. (a) Data can also be represented by using a pie chart (circle graph), It shows the relationship between a whole and its parts,

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

(a) 180° (b) 360°

(c) 270° (d) 90°

Answer. (b) The total angle at the centre of the circle is 360°.
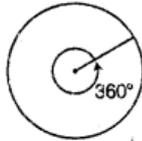
Question. 4 The range of the data 30, 61, 55, 56, 60, 20, 26, 46, 28, 56 is
(a) 26 (b) 30
(c) 41 (d) 61
Answer. (c) Range of data = Maximum value − Minimum value = 61 − 20 = 41

Question. 5 Which of the following is not a random experiment?
(a) Tossing a coin
(b) Rolling a die
(c) Choosing a card from a deck of 52 cards
(d) Throwing a stone from the roof of a building
Answer. (d) Tossing a coin, rolling a die and choosing a card from a deck of 52 cards are the random experiments, as we don't have an idea about the output of these experiments. But if we throw a stone from the roof of a building, we know the output, it will fail on the ground.

Question. 6 What is the probability of choosing a vowel from the alphabets?
(a) $\dfrac{21}{26}$ (b) $\dfrac{5}{26}$
(c) $\dfrac{1}{26}$ (d) $\dfrac{3}{26}$

Answer. Total number of alphabets = 26
Total number of vowels =5

Probability of choosing a vowel from the alphabets $= \dfrac{\text{Total number of vowels}}{\text{Total number of alphabets}} = \dfrac{5}{26}$

Question. 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
Answer. (b) Given, 3 out of 5 students can participate in a competition, i.e. 2 out of 5 students cannot participate in a competition.
Hence, probability of students who do not make it to competition $\frac{2}{5}$ = 0.4
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 the questions 8-10 based on it.
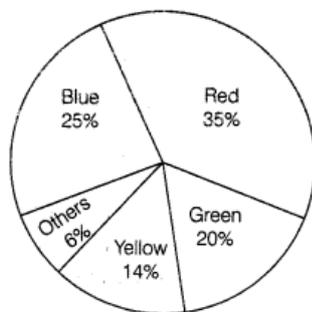
Question.8 Which colour received $\frac{1}{5}$ of the votes?
(a) Red (b) Blue
(c) Green (d) Yellow
Answer.

(c) Blue (25%), i.e. $\frac{25}{100} = \frac{1}{4}$ of votes received by blue.

Red (35%), i.e. $\frac{35}{100} = \frac{7}{20}$ of votes received by red.

Green (20%), i.e. $\frac{20}{100} = \frac{1}{5}$ of votes received by green.

Yellow (14%), i.e. $\frac{14}{100} = \frac{7}{50}$ of votes received by yellow.

Others (6%), i.e. $\frac{6}{100} = \frac{3}{50}$ of votes received by others.

Hence, green is the required colour.

Question. 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

Answer. (c) If total number of votes = 400

Then, number of votes in favour of 'Others' = 6% of 400 = $\frac{6}{100}$ x 400 = $\frac{3}{50}$ x 400 = 24

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

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

(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 colours is approximately the same as those for red colour

Answer. (d) Number of students liking together yellow and green colours is (14+ 20)% i.e. 34%, which is approximately the same as those for red (35%).

Question. 11 Listed below are the temperatures in °C for 10 days.

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

What is the range of the data?

(b) 13°C (d) 12°C

Answer. (b) Range of data = Maximum temperature – Minimum temperature = 5-(-8)= 5+8= 13 Hence, the range of data is 13°C.

Question. 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

(a)$\frac{7}{20}$

(b)$\frac{3}{5}$

(c)$\frac{1}{5}$

(d)$\frac{1}{4}$

Answer. (c) Total number of buttons = 4+ 7+ 3+ 6 = 20

Probability that button on the floor is blue = $\frac{\text{Number of blue buttons}}{\text{Total number of buttons}} = \frac{4}{20} = \frac{1}{5}$

Question. 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. Yash wins, if it lands on green. Which of the following spinners should be used to make the game fair?

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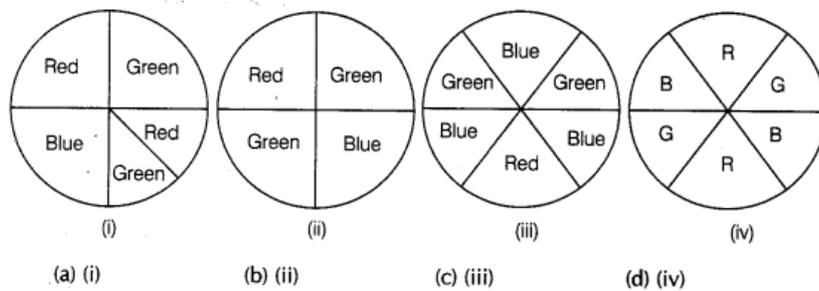
(a) (i)   (b) (ii)   (c) (iii)   (d) (iv)

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

Answer. (d) The figure (iv) should be selected to make the game fair as the area occupied by each colour is equal. Hence, the chance of winning for each person is equal.

Question. 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

Answer. (d) Given classes are 0-10 and 10-20.

As, the class of given classes is 10, so the next classes will be 20-30 and 30-40.

As, the fourth class is 30-40.

Hence, the lower limit of fourth class is 30.

Question. 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)$\frac{4}{5}$

Answer. (b) Given, head appeared 120 times, if a coin is tossed 200 times. Then, probability of getting a head in this experiment=

$$= \frac{\text{Number of times head appeared}}{\text{Number of times coin is tossed}} = \frac{120}{200} = \frac{3}{5}$$

Question. 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°

Answer. (c) Percentage of buyers who selected the particular brand of toothpaste = 40%

Central angle of the sector of pie chart representing the above information

=40% of central angle

$= \frac{40}{100}$ x 360° = 144°

Question. 17 Monthly salary of a person is ? 15000. The central angle of the sector representing his eiqjenses 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

Answer. (b) Central angle of the sector representing his expenses on food and house rent on a pie chart =60°

Part of the monthly salary he is expending on food and house rent = <mark>Formula does not parse</mark>= $\frac{1}{6}$

Hence, the amount he spends on food and house rent =$\frac{1}{6}$ x Monthly salary

$\frac{1}{6}$x 15000=Rs. 2500

Question. 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
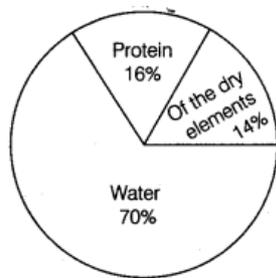
(a)108° (b) 54° (c)30° (d)216°

Answer. (a) Distribution of protein and other constituents in human body = 16+14 = 30%

Central angle of the sector showing the distribution of protein and other constituents

$= \frac{30}{100}$ x 360° = 108°

Question. 19 Rohan and Shalu are playing with 5 cards as shown in the given figure. What is the probability of Rohan picking a card without seeing, that has the number 2 on it?
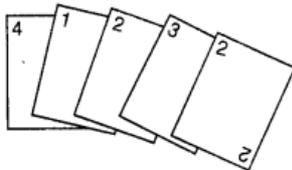
(a)$\frac{2}{5}$ (b)$\frac{1}{5}$ (c) $\frac{3}{5}$ (d)$\frac{4}{5}$

Answer. (a) Total number of cards = 5

Number of cards having 2 on it = 2

Probability of Rohan picking a card without seeing, that has the number 2 on it $\frac{2}{5}$
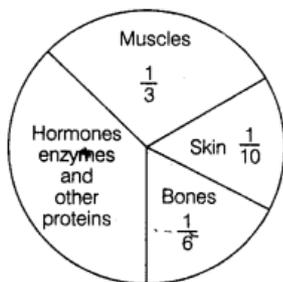
In questions 20 to 22, the following pie chart represents the distribution of proteins in parts of human body.

Question. 20 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

Answer. Distribution of protein in muscles $=\frac{1}{3}$

Distribution of protein in bones $= \frac{1}{6}$

Ratio of distribution of proteins in the muscles to that of proteins in the bones

$= \frac{1}{3} : \frac{1}{6} = \frac{1}{3}$ x $\frac{1}{6}$

= 2:1

Question. 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°

Answer.

The portion representing skin and bones together $= \frac{1}{10} + \frac{1}{6}$

$= \frac{3+5}{30} = \frac{8}{30}$

Central angle of the sector representing skin and bones together

$= \frac{8}{30} \times 360° = 96°$

Question. 22 What is the central angle of the sector representing hormones enzymes and other proteins?

(a) 120° (b) 144° (c)156° (d)176°

Answer.

The portion representing hormones enzymes and other proteins $= 1 - \left(\dfrac{1}{3} + \dfrac{1}{10} + \dfrac{1}{6}\right)$

$$= 1 - \left(\dfrac{20 + 6 + 10}{60}\right) = 1 - \dfrac{36}{60} = \dfrac{60 - 36}{60} = \dfrac{2}{5}$$

Central angle of the sector representing hormones enzymes and other proteins

$$= \dfrac{2}{5} \times 360° = 144°$$

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

Answer.Total number of times coin tossed =12

Total number of occurrence of head = 5

The chance of occurrence of head $= \dfrac{Number\,of\,times\,head\,appeared}{Number\,of\,times\,a\,coin\,is\,tossed}$

$= \dfrac{5}{12}$

Question. 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

Answer. (d) Given, a bag contains 3 red, 5 black and 4 blue balls.

Then, total number of outcomes = Total number of balls = 3+ 5+ 4 = 12

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

(a) pictograph (b) histogram

(c) pie chart (d) double bar graph

Answer. (d) A graph showing two sets of data simultaneously is known as double bar graph.

Question. 26 Size of the class 150-175 is

(a) 150 (b) 175

(c) 25 (d) -25

Answer. (c) Size of the class 150-175 = Upper limit – Lower limit = 175 -150 = 25

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

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

(c)1 (d) 0

Answer. (d) In a die, there are only 6 numbers, which are 1,2, 3, 4, 5 and 6.

Hence, there is no possibility of number 7.

Therefore, probability of getting the number 7 is 0.

Question. 28 Data represented using circles is known as

(a) bar graph (b) histogram

(c) pictograph (d) pie chart

Answer. (d) Data represented using circles is known as pie chart.

Note Bar graph Data using bars of different heights in a graphical display is known as bar graph (bar chart).

Histogram Grouped data can be represented by a histogram.

Pictograph Data using pictures and symbols to represent the statistical information is known as pictograph.

Question. 29 Tally marks are used to find
(a) class intervals (b) range (c) frequency (d) upper limit
Answer. (c) Tally marks are used to find the frequency of the observations.

Question. 30 Upper limit of class interval 75-85 is
(a) 10 (b)-10 (c)75 (d) 85
Answer. (d) Upper limit of class interval 75-85 is 85.

Note The upper value of class interval is called its upper class limit and lower value of a class interval is called lower class limit

Question. 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)$\frac{4}{5}$
Answer. (c) Numbers on the slips are 1,2, 3, 4 and 5.
Odd numbers = 1,3, 5
Number of slips bears an odd number = 3
Probability that the slip bears an odd number = $\frac{Number\,of\,slips\,bear\,s\,an\,odd\,number}{Total\,number\,of\,slips}$
=$\frac{3}{5}$

Question.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?
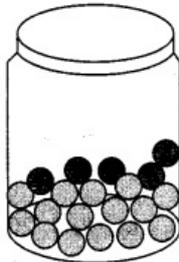
(a)$\frac{7}{10}$ (b) $\frac{3}{10}$ (c) $\frac{4}{5}$ (d)$\frac{2}{5}$
Answer. As, jar contains 6 red, 5 green, 4 blue and 5 yellow marbles of same size. Then, probability that the chosen marble is of red colour
$= \frac{Number\,of\,red\,marbles}{Total\,number\,of\,marbles} = \frac{6}{6 + 5 + 4 + 5} = \frac{6}{20} = \frac{3}{10}$

Question. 33 A coin is tossed two timgs. The number of possible outcomes is
(a) 1 (b) 2 (0 3 (d) 4
Answer. (d) Number of possible outcomes is 4, i.e. HH, HT, TH, TT.

**Question. 34 A coin is tossed three times. The number of possible outcomes is**
(a) 3 (b) 4 (0 6 (d) 8
Answer. (d) Number of possible outcomes is 8, i.e. HHH, HHT, HTH, THH, TTH, THT, HTT, TTT.

Question. 35 A die is tossed two times. The number of possible outcomes is (a) 12 (b) 24 (c)36 (d) 30
Answer. (c) Number of possible outcomes is 36,
i.e. (1,1), (1, 2), (1,3), (1,4), (1,5), (1,6)

(2, 1), (2, 2), (2, 3).... (2, 6)
(3,1), (3,2), (3,3).... (3,6)
(4, 1), (4,2).... (4,6)
(5, 1), (5,2).... (5,6)
(6,1),(6, 2).... (6,6)

Fill in the Blanks

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

Question. 36 Data available in an unorganised form is called.............. data.
Answer. raw
Data available in an unorganised form is called raw data.

Question. 37 In the class interval 20-30, the lower class limit is...........
Answer. 20
In the class interval 20-30, the lower class limit is 20.

Question. 38 In the class interval 26-33, 33 is known as..........
Answer. upper class limit
In class interval 26-33, 33 is known as upper class limit.

Question. 39 The range of the data 6, 8, 16, 22, 8, 20, 7, 25 is.............
Answer. 19
Range .of the given data = Maximum value − Minimum value = 25 − 6 = 19

Question. 40 A pie chart is used to compare .... to a whole.
Answer. a part
A pie chart is used to compare a part to a whole.

Question. 41 In the experiment of tossing a coin one time, the outcome is either................or....................
Answer. head, tail On tossing a coin one time, the outcome'can-be head or tail.

Question. 42 When a die is rolled, the six possible outcomes are................ .
Answer. 1,2, 3, 4, 5, 6
When a die is rolled, then the six possible outcomes are 1,2, 3, 4, 5 and 6.

Question. 43 Each outcome or a collection of outcomes in an experiment makes an
....
Answer. event
Each outcome or a collection of outcomes in an experiment makes an event.

Question. 44 An experiment whose outcomes cannot be predicted exactly in advance, is called a.............. experiment.
Answer. random
An experiment whose outcomes cannot be predicted exactly in advance, is called a random experiment.

Question. 45 The difference between the upper and lower limits of a class interval is called the.................. of the class interval.
**Answer.** size
The difference between the upper and lower limits of a class interval is called the size of the class interval.

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

Answer. 35-40

From the first two intervals, we can observe that the class size is 5. So, the sixth class interval will be 35-40.

Histogram given below shows the number of people owning the different number of books. Answer 47 to 50 based on it.
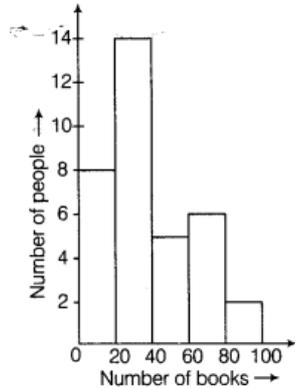
Question. 47 The total number of people surveyed is……………. .

Answer. 35

Total number of people surveyed = 8 + 14 +-5 + 6 + 2 = 35

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

Answer. 8

The number of people owning books more than 60 = 6 + 2 = 8

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

Answer. 22

The number of people owning books less than 40 = 8 + 14 = 22

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

…………………..

Answer. 14

The number of people having books more than 20 but less than 40 = 14

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

Answer. frequency

The number of times an observation occurs in a given data, is called its frequency.

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

Answer. class Intervals

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

Question. 53 The total number of outcomes when a coin is tossed, is……………… .

Answer. 2

The total number of outcomes'when a coin is tossed, is 2 i.e. head or tail.

Question. 54 The class size of the interval 80-85 is…………… .

Answer. 5

Class size of the interval 80-85 = Upper class limit − Lower class limit= 85-80=5

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

Answer. bars

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

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

Answer. likely

When a die is thrown, outcomes 1, 2, 3, 4, 5, 6 are equally likely. As, their chances to appear are equal.

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

Answer. X, Y

In a histogram, class intervals are taken along X-axis and frequencies are taken along Y-axis.

Question. 58 In the class intervals 10-20 and 20-30 respectively, 20 lies in the class.................. .

Answer. 20-30

In the class intervals 10-20 and 20-30 respectively, 20 lies in the class 20-30.

True/False

In questions 59 to 81, state whether the statements are True or False.

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

Answer. True

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

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

Answer. False

The central angle of a sector in a pie chart can be more than 180°, but not more than 360°.

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

Answer. True

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

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

Answer. True

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

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

Answer. True

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

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

Answer. True

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

Using the following frequency table, answer the questions 65-68.

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

Question. 65 9 students got full marks.

Answer. True

9 students got full marks.

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

Answer. False

The frequency of less than 8 marks = 5+10+8 = 23

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

Answer. True

The frequency of more than 8 marks = 12 + 9 = 21

**Question. 68 10 marks has the highest frequency.**

Answer. False

9 Marks has the highest frequency.

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

Answer. False

If fifth class interval is 60-65 and fourth class interval is 55-60, then third class interval is 50-55, second class interval is 45-50 and first class interval is 40-45.

Question. 70 From the histogram given below, we can say that 1500 males above the age of 20 are literate.
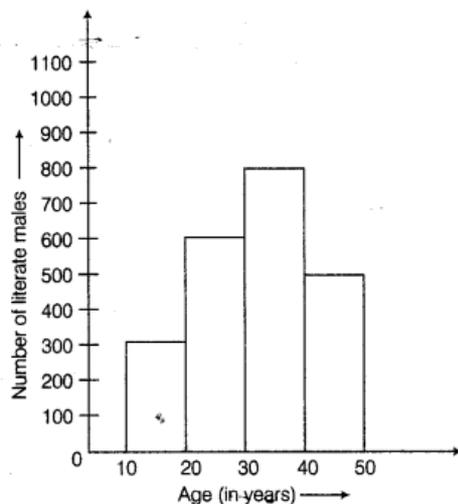
Answer. False

Number of literate males above the age of 20 yr= 600 + 800 + 500 = 1900

Question. 71 The class size of the class interval 60-58 is 8.

Answer. True

Class size of the class interval 60-68 = Upper class limit − Lower class limit = 68 − 60= 8

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

Answer. False

When a pair of coins is tossed, then the number of outcomes are 4, i.e. HH, HT, TH and TT.

Question. 73 On throwing a die once, the probability of occurrence of an even number $\frac{1}{2}$

Answer. True

On throwing a die, the occurrence of even numbers can be as 2, 4 and 6.

Hence, probability of occurrence of a even number $= \frac{Number\ of\ even\ numbers\ on\ a\ die}{Total\ numbers\ on\ a\ die}$

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

Question. 74 On throwing a die once, the probability of occurrence of a composite number is

$\frac{1}{2}$.

Answer. False

On throwing a die, the occurrence of composite numbers can be as 4, 6.

Hence, probability of occurrence of a composite number

$$= \frac{Number\ of\ composite\ numbers\ on\ a\ die}{Total\ numbers\ on\ a\ die}$$

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

Question. 75 From the given pie chart, we can infer that production of Manganese is least in state B.
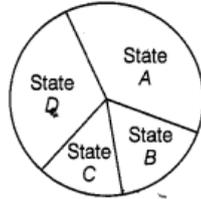
Production of manganese in 4 different states

Answer. False

From the given pie chart, we cannot infer that production of manganese is least in state B. Unless we know the central angle for it.

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

Answer. True

One or more outcomes of an experiment make an event.

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

Answer. False

The probability of getting number 6 or number 5 on a throw of a die $= \frac{1}{6}$

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

Answer. False

In throw of a die, the occurrence of prime numbers can be as 2, 3, 5 and occurrence of composite numbers can be as 4, 6.

Hence, the probability of getting a prime number is 3/6 and of getting is 2/61, which is a composite not same.

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

Answer. True

In throw of a die, the occurrence of even numbers can be as 2, 4, 6 and the occurrence of odd numbers can be as 1,3, 5.

Hence, probability of getting an even number is same as that of getting an odd number on a throw of a die.

Question. 80 To verify Pythagoras theorem is a random experiment.

Answer. False

Verifying Pythagoras theorem is not a random experiment, because we already know the result.

Question. 81 The following pictorial representation of data is a histogram.
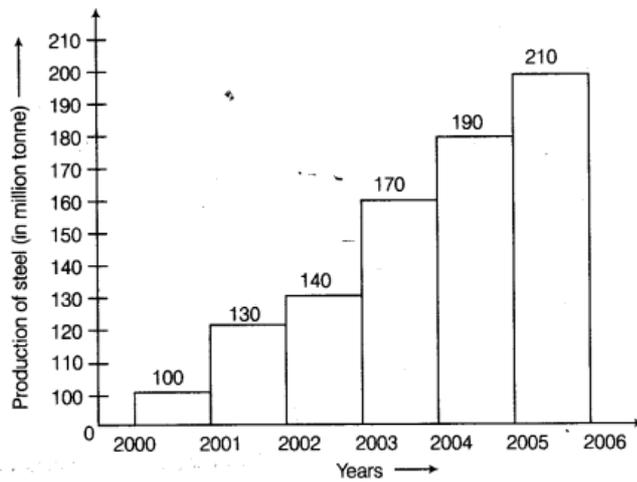
Answer. True

Question. 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?

Answer. (a) The lower limit of second class interval (20-30) is 20.

(b) The .upper limit of the last class interval (50-60) is 60.

(c) The frequency of the third class (30-40) is 4.

(d) The interval (20-30) has a frequency of 10.

(e) The interval (30-40) has the lowest frequency, i.e. 4.

(f) We know that,

Class size = Upper class limit − Lower class limit Consider first class, i.e. 10-20, then class size = 20-10 = 10

Question. 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 (in km/h)	Frequency
10-20	5
20-30	5
30-40	10
40-50	8
50-60	0
60-70	2

Answer.

Scale
On X-axis, 1 small division = 10 km/h
On Y-axis, 1 small division = 1 frequency
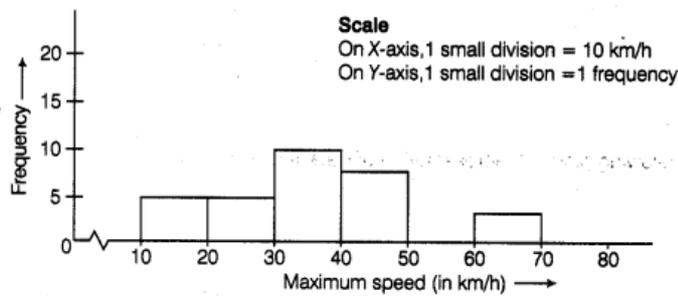
Question. 84 Given below is a pie chart showing the time spend by a group of 350 children in different games. Observe it and answer the questions that follow.
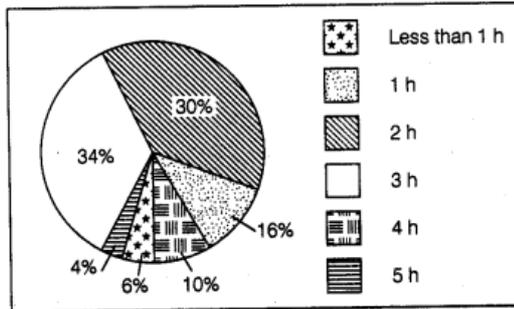
(a) How many children spend atleast one hour in playing games?

(b) How many children spend more than 2 h 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?

Answer. (a) Number of children who spend atleast 1 h in playing games i.e. the number of children playing 1 h or more than 1 h

= (Total number of children) − (Number of children spend less than 1 h)

= 350-6% of 350

= 350- $\frac{6}{100}$ x350

= 350 − 21 = 329

(b) Number of children who spend more than 2 h in playing games

= (34 + 10 + 4)%of the total number of students

= 48% of 350

= $\frac{48}{100}$ x350 = 168

(c) Number of children who spend 3 or lesser hours in playing games

= (34 + 30 + 16 + 6)% of total number of students

= 86% of 350

= $\frac{86}{100}$ x350= 301

(d) Number of children who spend 2 h or more per day in playing games

= (30 + 34 + 10 + 4)% of total number of students = 78% of total number of students

Number of children who spend less than one hour = 6% of total number of students

Clearly, number of children who play for 2 h or more per day is greater than the number of children who play for less than 1 h.

Question. 85 The pie chart given 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.

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

(b) What fraction of children travel by car?

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

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

Answer. (a) The central angle is maximum for bus, hence bus is the most common mode of transport.

(b) Fraction of children travelled by car = <mark>Formula does not parse</mark> = <mark>Formula does not parse</mark> $= \frac{1}{4}$

(c) We know that, fraction of children travel by car $= \frac{1}{4}$

Hence, total number of children travelled by car $= \frac{1}{4} \times$ Total number of children

$\Rightarrow 18 = \frac{1}{4} \times$ Total number of children

Total number of children $= 18 \times 4 = 72$

(d) The central angle made up the sectors representing cycle and walk are same. Hence, the cycle and walk are two modes of transport, by which equal number of children are travelling.

Question. 86 A die 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

Answer.

When a die is rolled once, then the possible outcomes are 1, 2, 3, 4, 5 and 6.

∴ Probability that number on top will be

(a) odd $= \frac{3}{6} = \frac{1}{2}$

(b) greater than 5 $= \frac{1}{6}$

(c) a multiple of 3 $= \frac{2}{6} = \frac{1}{3}$

(d) less than 1 $= 0$

(e) a factor of 36 $= \frac{5}{6}$

(f) a factor of 6 $= \frac{4}{6} = \frac{2}{3}$

Question. 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

Answer. (a) Certain to happen, because the sum of the angles of a triangle is 180°.

(b) May or may not happen, as the result of the match is unpredictable.

(c) Certain to happen, as the Sun always set in the evening.

(d) Impossible to happen, as there are only 6 possible outcomes on throwing a die, i.e. 1,2, 3, 4, 5 and 6.

(e) Impossible to happen, as the Sun rise from East.

(f) May or may not happen, as the winning of the competition is unpredictable.

Question. 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.

Answer.

From the pie chart we see that, percentage of each subject are,

Hindi = 16.67%, English= 25%, Social Science = 5.55%, Mathematics = 33.33% , Science = 19.44%

Given, marks obtained by student in an examination = 540

∴ The marks obtained in each subject are,

Hindi	$= \dfrac{16.67}{100} \times 540 = 90$
English	$= \dfrac{25}{100} \times 540 = 135$
Social Science	$= \dfrac{5.55}{100} \times 540 = 29.97 = 30$ (approx.)
Mathematics	$= \dfrac{33.33}{100} \times 540$
	$= 179.98 = 180$ (approx.)
Science	$= \dfrac{19.44}{100} \times 540 = 104.97 = 105$ (approx.)

Question. 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, then find the number of yellow balls.

Answer.

The probability of choosing a white ball $= \dfrac{2}{9}$

Then, the probability of choosing a yellow ball $= 1 - \dfrac{2}{9} = \dfrac{9-2}{9} = \dfrac{7}{9}$

Given, total number of balls in the bag = 36

∴ Number of yellow balls $= \dfrac{7}{9} \times 36 = 28$

Question. 90 Look at the histogram below and answer the questions that follow.
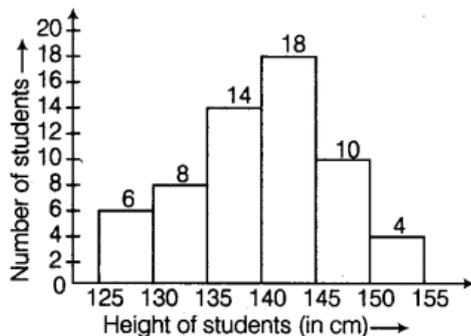
(a) How many students have height more than or equal to 135 cm, but less than 150 cm ?

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

(c) What is class size?

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

Answer. (a) Number of students who have height more than or equal to 135 cm, but less than 150 cm = 14+ 18+ 10 = 42

(b) The class interval 150-155 has the least number of students, i.e. 4.

(c) We-know, class size = Upper class limit − Lower class limit Consider any class, say (125-130), then class size = 130-125 = 5 Hence, the class size is 5.

(d) Number of students who have height less than 140 cm = 6 + 8 + 14 = 28

Question. 91 Following are the numbers 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.

Answer.

Class interval	Tally marks	Frequency
0-2		0
2-4	~~IIII~~ I	6
4-6	~~IIII~~ I	6
6-8	~~IIII~~ ~~IIII~~ I	11
8-10	II	2
Total		**25**

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

Answer.

Scale
On X-axis, 1 small division = 1 member
On Y-axis, 1 small division = 1 family
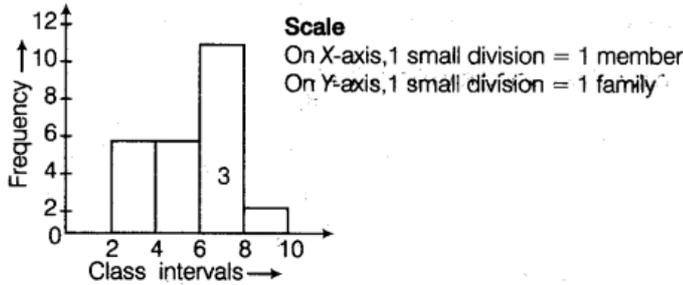
Question. 93 The marks obtained (out of 20) by 30 students of a class in a test are as follows:

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).

Answer.

Class interval	Tally marks	Frequency
4-8	II	2
8-12	~~IIII~~ II	7
12-16	~~IIII~~ ~~IIII~~ III	13
16-20	~~IIII~~ I	6
20-24	II	2
Total		**30**

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

Answer.

Scale
On X-axis, 1 small division = 1 mark
On Y-axis, 1 small division = 1 student
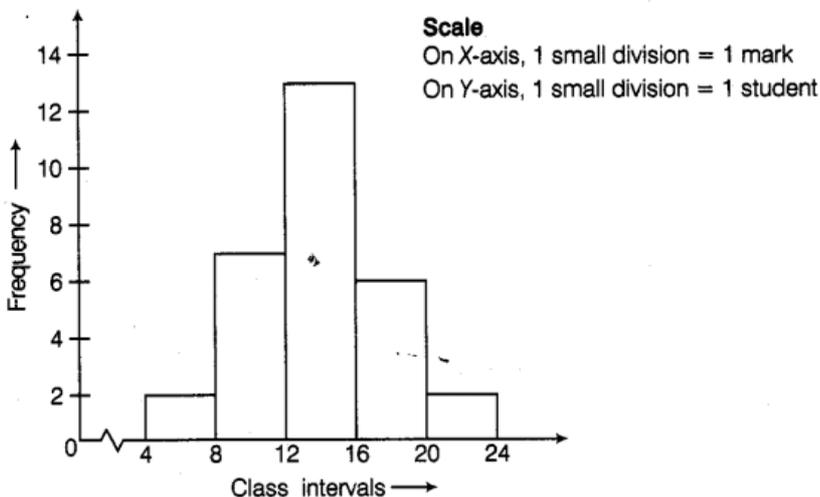
Question. 95 The weights (in kg) of 30 students of a class are as follows:

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?

Answer.

Class interval	Tally marks	Frequency
25-30	||	2
30-35	N| ||	7
35-40	N| N| |	11
40-45	N| ||	7
45-50	|||	3
Total		30

(i) The class interval 25-30 has the least frequency, i.e. 2.

(ii) The class interval 35-40 has the maximum frequency, i.e. 11.

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

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

Answer.

Total number of pairs of shoes sold $= (130 + 120 + 90 + 40 + 20) = 400$

$\therefore$ Central angle of pie chart representing the brand

(i) $A = \dfrac{130}{400} \times 360° = 117°$

(ii) $B = \dfrac{120}{400} \times 360° = 108°$

(iii) $C = \dfrac{90}{40} \times 360° = 81°$

(iv) $D = \dfrac{40}{400} \times 360° = 36°$

(v) $E = \dfrac{20}{400} \times 360° = 18°$
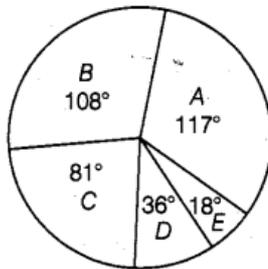
Question. 97 The following pie chart depicts the expenditure of a state government under different heads:
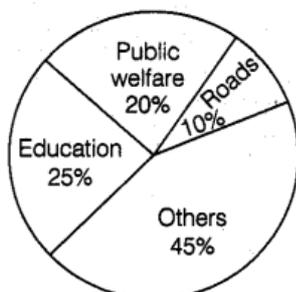
(i) If the total spending is 10 crore, how much money was spent on roads?

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

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

Answer.

(i) Money spent on roads = 10% of total spending = $\frac{10}{100} \times 10$ crore = 1 crore

(ii) Money spent on education = 25% of total spending = $\frac{25}{100} \times$ Total spending

Money spent on roads = 10% of total spending = $\frac{10}{100} \times$ Total spending

Now, $\frac{\text{money spent on education}}{\text{money spent on roads}} = \frac{25}{10}$

$\Rightarrow$ Money spent on education = 2.5 × Money spent on roads

(iii) Fraction of the total expenditure spent on both roads and public welfare

$= 10\% + 20\% = \frac{10}{100} + \frac{20}{100} = \frac{(10+20)}{100} = \frac{30}{100} = \frac{3}{10}$

Question. 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

Answer.

Total number of animals in a zoo = 120

∴ Central angle made in pie chart for representing the animals like

(i) Deer = $\frac{42}{120} \times 360° = 126°$
(ii) Elephant = $\frac{15}{120} \times 360° = 45°$

(iii) Giraffe = $\frac{26}{120} \times 360° = 78°$
(iv) Reptiles = $\frac{24}{120} \times 360° = 72°$

(v) Tiger = $\frac{13}{120} \times 360° = 39°$
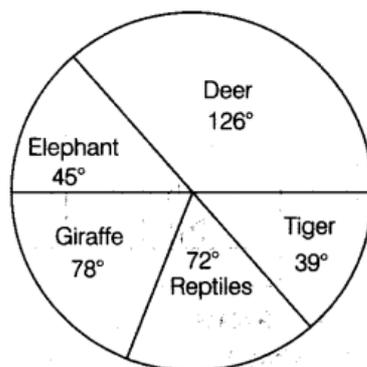
Question. 99 Playing cards

(a) From a pack of cards, the following cards are kept face down:
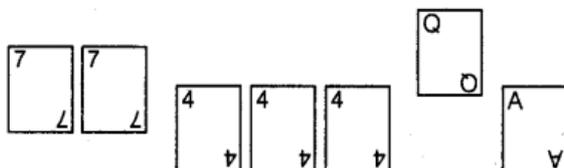
Suhail wins if he picks up face card. Find probability of Suhail winning?

(b) Now, the following cards are added to the above cards:
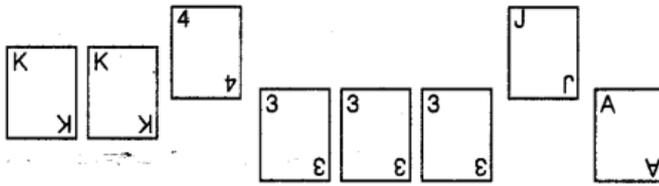
What is the probability of Suhail winning now ? Reshma wins, if she picks up a 4. What is the probability of Reshma winning? [Queen, King and Jack cards are called face cards.]

Answer.

(a) P (Suhail winning) $= \dfrac{1}{7}$ [as there is only one face card]

(b) P (Suhail winning now) $= \dfrac{4}{15}$ [as there are 4 face cards]

P (Reshma winning) $= \dfrac{4}{15}$ [as there are four 4-number cards]

Question. 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?

Answer.

Class interval	Tally marks	Frequency
30-35	|||	3
35-40	|||	3
40-45	|||	3
45-50	|||	3
50-55	ℕℕ	5
55-60	||||	4
60-65	ℕℕ	5
65-70	||	2
70-75	ℕℕ ||	7
Total		**35**

(a) There are total number of 9 classes in the frequency distribution table.

(b) The weight group 70-75 has the highest frequency, i.e. 7.

Question. 101 Complete the following table.

| Weight (in kg)	Tally marks	Frequency (Number of persons)
40-50	ℕℕ ℕℕ ||	
50-60	ℕℕ ℕℕ ||||	
60-70	ℕℕ		
70-80	||	
80-90			

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

Answer.

Weight (in kg)	Tally marks	Frequency (Number of persons)
40-50	ℕℕ ℕℕ ||	12
50-60	ℕℕ ℕℕ ||||	14
60-70	ℕℕ		6
70-80	||	2
80-90			1

∴ Total number of persons $= 12 + 14 + 6 + 2 + 1 = 35$

Question. 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

Answer.

Scale
On X-axis, one big division = 5 units
On Y-axis, one big division = 10 units
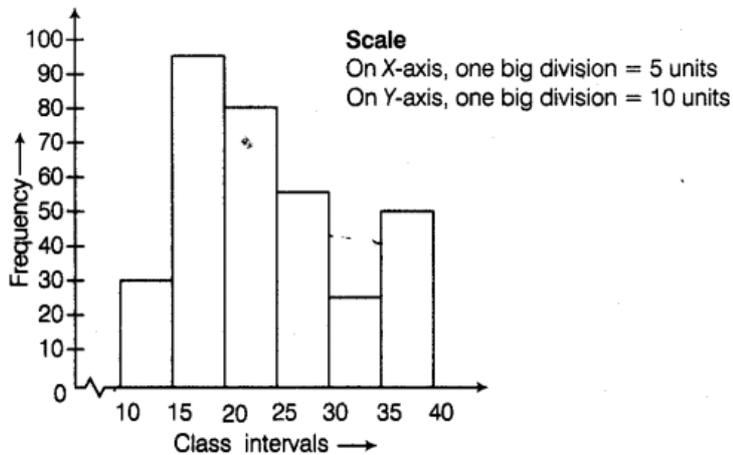
Question. 103 In a hypothetical sample of 20 people, the amount of money (in t thousands) with each was found to be as follows:

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.

Answer. Before preparing histogram of the given data, we will prepare the frequency distribution table.

Amount (in ₹ thousand)	Tally marks	Frequency (Number of persons)
50-100	I	1
100-150	⅂Ⅱ ⅂Ⅱ II	12
150-200	IIII	4
200-250	III	3

Scale
On X-axis, 1 big division = ₹ 50 thousand
On Y-axis, 1 big division = 2 persons
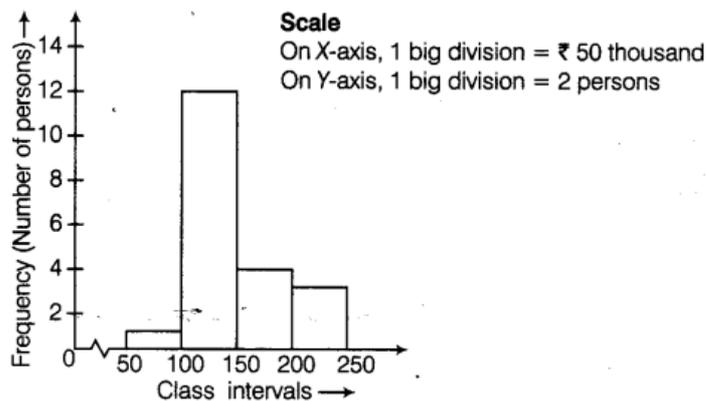
Question. 104 The below histogram shows the number of literate females in the age group of 10 yr to 40 yr in a town.
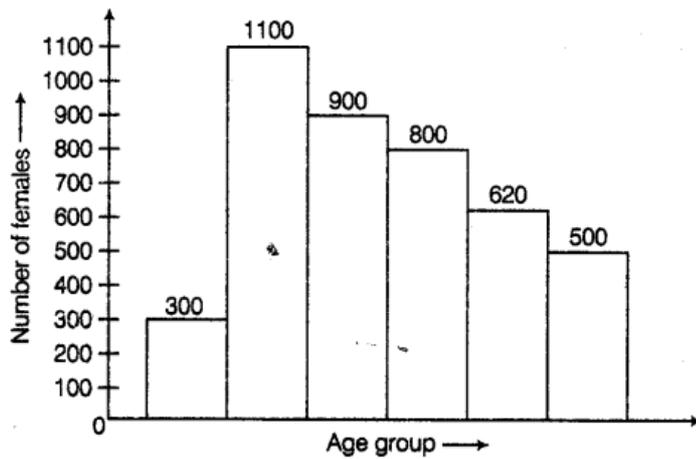
(a) Write the classes assuming all the classes are of equal width.

(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?

Answer. (a) As we know that, the age group of 10 yr to 40 yr is to be divided into classes of equal width, starting with 10. Then, the classes of equal width can be written as . 10-15,15-20,20-25,25-30, 30-35,35-40 ,

(b) The width of the classes is 5, as the difference .between upper class limit and lower class limit is 5.

(c) In the age group of 10-15, the number of literate females is the least.

(d) In the age group of 15-20, the number of literate females is the highest.

Question. 105 The following histogram shows the frequency distribution of teaching experiences of 30 teachers in various schools:
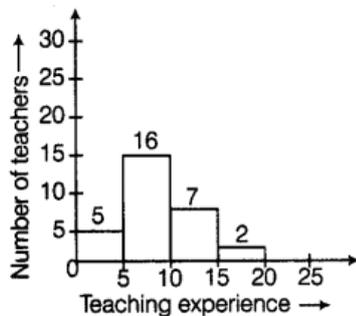
(a) What is the class width?

(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?

Answer. (a) In the histogram, we see that the class width Is 5.

(b) By the histogram, it is clear that two teachers have the maximum teaching experience,i.e. 15-20 years, and five teachers have the least teaching experience, i.e. 0-5 years.

(c) The number of teachers having experience from 10 to 20 years, is 7 + 2, i.e. 9.

Question. 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.

Answer.

Total number of branches = 30 + 17 + 15 + 10 = 72

Bank	Number of branches	Central angle
State Bank of India	30	$\frac{30}{72} \times 360° = 150°$
Bank of Baroda	17	$\frac{17}{72} \times 360° = 85°$
Punjab National Bank	15	$\frac{15}{72} \times 360° = 75°$
Canara Bank	10	$\frac{10}{72} \times 360° = 50°$

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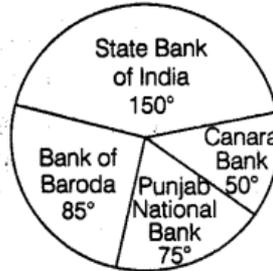
Question. 107 For the development of basic infrastructure in a district, a project of Rs 108 crore approved by Development Bank is as follows:

Item head	Road	Electricity	Drinking water	Sewerage
Amount (in ₹ crore)	43.2	16.2	27.00	21.6

Draw a pie chart for this data.

Answer.

Total amount = ₹ 108 crore

Item head	Amount (in ₹ crore)	Central angle
Road	43.2	$\frac{43.2}{108} \times 360° = 144°$
Electricity	16.2	$\frac{16.2}{108} \times 360° = 54°$
Drinking water	27.00	$\frac{27}{108} \times 360° = 90°$
Sewerage	21.6	$\frac{21.6}{108} \times 360° = 72°$

The pie chart is as follows:
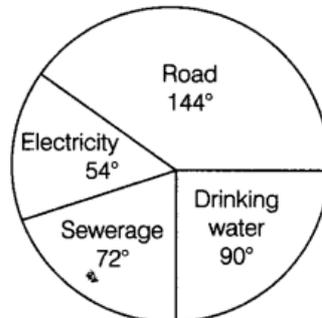
Question. 108 In the time table of a school, periods allotted per week to different teaching subjects are given below.

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.

Answer.

Total periods = 7 + 8 + 8 + 8 + 7 + 4 + 3 = 45

Subject	Periods allotted	Central angle
Hindi	7	$\frac{7}{45} \times 360° = 56°$
English	8	$\frac{8}{45} \times 360° = 64°$
Maths	8	$\frac{8}{45} \times 360° = 64°$

Subject	Periods allotted	Central angle
Science	8	$\frac{8}{45} \times 360° = 64°$
Social Science	7	$\frac{7}{45} \times 360° = 56°$
Computer	4	$\frac{4}{45} \times 360° = 32°$
Sanskrit	3	$\frac{3}{45} \times 360° = 24°$

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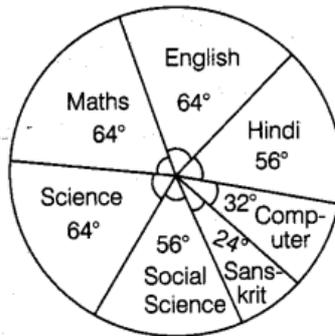
Question. 109 A survey was carried out to find the favourite beverage preferred by a certain group of young people. The following pie chart shows the findings of this survey.

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?

Answer.

(i) The percentage of people preferring cold drinks is maximum. So, cold drinks is liked by the maximum number of people.

(ii) From the pie chart, number of people who like tea = 45

⇒ 15% of total number of people surveyed = 45

⇒ $\frac{15}{100} \times$ Total number of people surveyed = 45

∴ Total number of people surveyed = $\frac{45 \times 100}{15} = 300$

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

Ocean	Percentage of water
Pacific	40%
Atlantic	30%
Indian	20%
Others	10%

Answer.

Ocean	Central angle
Pacific	$\dfrac{40}{100} \times 360° = 144°$
Atlantic	$\dfrac{30}{100} \times 360° = 108°$
Indian	$\dfrac{20}{100} \times 360° = 72°$
Others	$\dfrac{10}{100} \times 360° = 36°$

The pie chart is as follows:
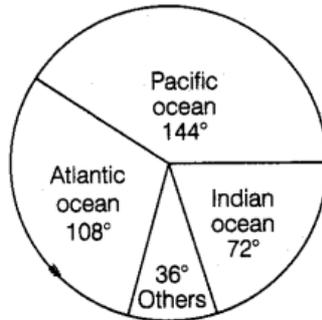
Question. 111 At a birthday party, the children spin a wheel to get a gift.
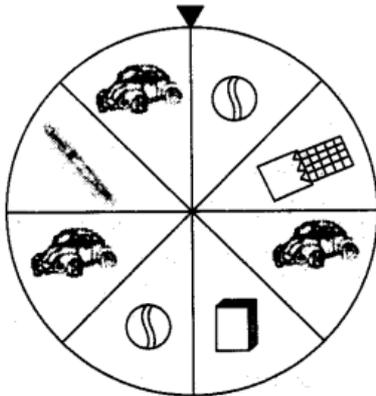
Find the probability of
(a) getting a ball (b) getting a toy car
(c) getting any toy except a chocolate.

Answer.

(a) The probability of getting a ball

$= \dfrac{\text{Number of events of getting a ball}}{\text{Total number of events}} = \dfrac{2}{8} = \dfrac{1}{4}$

(b) The probability of getting a toy car

$= \dfrac{\text{Number of events of getting a toy car}}{\text{Total number of events}} = \dfrac{3}{8}$

(c) The probability of getting any gift except a chocolate

$= \dfrac{\text{Number of events of getting any gift except a chocolate}}{\text{Total number of events}} = \dfrac{7}{8}$

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

| R 1 | Y 2 | Y 3 | R 4 | B 5 |

| B 6 | G 7 | Y 8 | R 9 | G 10 |
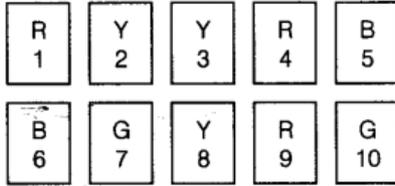
Find the probability of getting (a) an odd number (b) a Y card

(c) a G card (d) a B card bearing number greater than 7.

Answer.

(a) The probability of getting an odd number

$$= \frac{\text{Number of events getting an odd number}}{\text{Total number of events}} = \frac{5}{10} = \frac{1}{2}$$

(b) The probability of getting a Y card

$$= \frac{\text{Number of events getting a Y card}}{\text{Total number of events}} = \frac{3}{10}$$

(c) The probability of getting a G card

$$= \frac{\text{Number of events getting a G card}}{\text{Total number of events}} = \frac{2}{10} = \frac{1}{5}$$

(d) The probability of getting a B card bearing number greater than 7

$$= \frac{\text{Number of events getting a B card bearing number greater than 7}}{\text{Total number of events}} = \frac{0}{10} = 0$$

Identify which symbol should appear in each sector of questions 113 and 114.

Question. 113
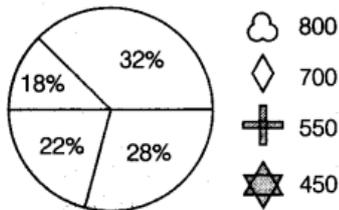
Answer.

Total Quantity obtained from the given four symbols = 800 + 700 + 550 + 450 = 2500
From the pie chart,

$$28\% \text{ of } 2500 = \frac{28}{100} \times 2500 = 700$$

$$22\% \text{ of } 2500 = \frac{22}{100} \times 2500 = 550$$

$$18\% \text{ of } 2500 = \frac{18}{100} \times 2500 = 450$$

$$32\% \text{ of } 2500 = \frac{32}{100} \times 2500 = 800$$

Thus, 32% → ♣

28% → ◇

22% → ✚

18% → ✡

Question. 114

Red colour

 192

Yellow colour

 228

Pink colour

 180
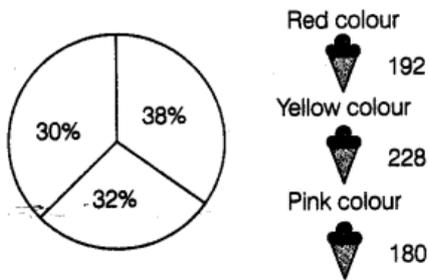
Answer.

Total quantity obtained from the given three colours $= 192 + 228 + 180 = 600$

Also,

$$600 = 100\%$$

or

$$1 = \frac{100}{600}\% = \frac{1}{6}\%$$

or

$$192 = \frac{1}{6} \times 192 = 32\%$$

or

$$228 = \frac{1}{6} \times 228 = 38\%$$

or

$$180 = \frac{1}{6} \times 180 = 30\%$$

$\therefore$ Red colour $\rightarrow 32\%$

Yellow colour $\rightarrow 38\%$

Pink colour $\rightarrow 30\%$

Question. 115 A financial counsellor gave a client this pie chart describing how to budget his income. If the client brings home ₹ 50000 each month, how much should he spend in each category?

1. Housing
2. Food (including eating out)
3. Car loan and maintenance
4. Utilities
5. Phone
6. Clothing
7. Entertainment
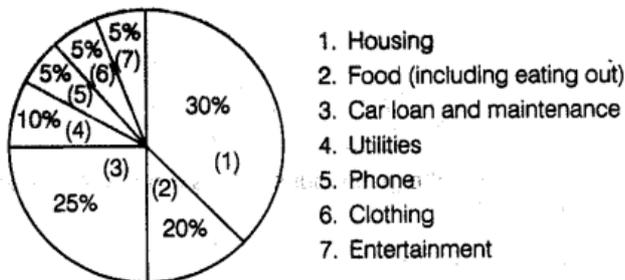
Answer.

Monthly income = ₹ 50000

Category	Money spent
Housing	$\frac{30}{100} \times 50000 = 15000$
Food (including eating out)	$\frac{20}{100} \times 50000 = 10000$
Car loan and maintenance	$\frac{25}{100} \times 50000 = 12500$
Utilities	$\frac{10}{100} \times 50000 = 5000$
Phone	$\frac{5}{100} \times 50000 = 2500$
Clothing	$\frac{5}{100} \times 50000 = 2500$
Entertainment	$\frac{5}{100} \times 50000 = 2500$

Question. 116 Following is a pie chart showing the amount spent (in Rs thousands) by a company on various modes of advertising for a product.Now, answer the following questions.

(i) Which type of media advertising is the greatest amount of the total?

(ii) Which type of media advertising is the least amount of the total?

1. Television
2. Newspaper
3. Magazines
4. Radio
5. Business papers
6. Direct mail
7. Yellow page
8. Outdoor
9. Miscellaneous
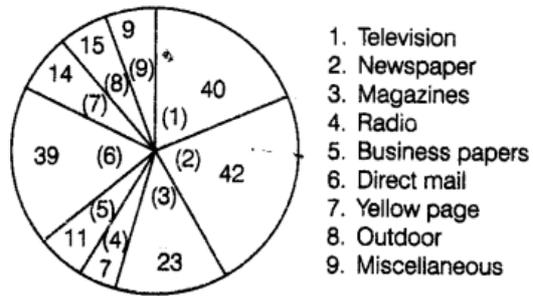
Answer.(i) The greatest amount of the total is spent in the advertisement of newspaper, i.e. Rs 42.

(ii) The least amount of the total is spent in the advertisement of radio, i.e. Rs 7 thousand.