Chapter 6 Statistics

Ex 6.1

Question 1. Fill in the blanks: (i) Data has already been collected by some other person is data. Answer: Secondary
 (ii) The upper limit of the class interval (25-35) is Answer: 35
 (iii) The range of the data 200, 15, 20, 103, 3, 196, is Answer: 197
 (iv) If a class size is 10 and range is 80 then the number of classes are Answer: 8
(v) Pie chart is a graph. Answer: circular
Question 2. Say True or False: (i) Inclusive series is a continuous series. Answer: False
(ii) Comparison of parts of a whole may be done by a pie chart. Answer: True
(iii) Media and business people use pie charts. Answer: True

(iv) A pie diagram is a circle broken down into component sectors.

Answer:

True

Question 3.

Represent the following data in ungrouped frequency table which gives the number of children in 25 families.

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

Answer:

The data given is raw data. Ascending order : 0, 1, 2, 3, 4, 5, 6

Number of children	Tally marks	Frequency
0		2
1	1	6
2	1	6
3		4
4		3
5		3
6		1
Total		25

∴ Tabulating in frequency distribution table we get

Number of children in family	0	1	2	3	4	5	6
Frequency	2	6	6	4	3	3	1

Question 4.

Form a continuous frequency distribution table for the marks obtained by 30 students in a X std public examination.

328, 470, 405, 375, 298, 326, 276, 362, 410, 255, 391, 370, 455, 229, 300, 183, 283, 366, 400, 495, 215, 157, 374, 306, 280, 409, 321, 269, 398, 200.

Answer:

Maximum mark obtained = 495 Minimum marks obtained = 157 Range = Maximum value – Minimum value Range = 495 – 157 = 338

If we take the class size as 50 then the number of class intervals possible

Range

Class size

 $=\frac{338}{50}=6.76$ $\cong 7$

The percentage difference calculator is here to help you compare two numbers.

Question 5.

A paint company asked a group of students about their favourite colours and made a pie chart of their findings. Use the information to answer the following **Question**s.

(i) What percentage of the students like red colour?

(ii) How many students liked green colour?

(iii) What fraction of the students liked blue?

(iv) How many students did not like red colour?

(v) How many students liked pink or blue?

(vi) How many students were asked about their favourite colours?

Class Intervals	Tally Marks	Frequency
150 - 200		2
200 - 250		3
250 - 300	1	6
300 - 350	1	5
350 - 400	1	7
400 - 450		4
450 - 500		3
Tota	al	30

Answer:

Total percentage of students = 100 % $\therefore 50$ students = 100% - (30% + 20% + 25% + 15%) = 100% - 90% 50 students = 10% 10% of total students = 50 $\therefore \frac{10}{100}$ (Total students) = 50 Total students = $\frac{50 \times 100}{10}$ = 500. Total students = 500.

(i) 20% of the students like red colour.

(ii) 15% of the students liked green colour. $\frac{15}{100} \times 500 = 75$ students liked green colour. (iii) 25% students liked blue students liked blue.

 $\Rightarrow \frac{25}{100}$ students liked blue. ⇒ $\frac{1}{4}$ students liked blue.

(iv) Percentage of students liked red colour

= 20%

Percentage of students did not like red colour

- = 100% 20%
- = 80%

 \therefore Number of students did not like red colour

= 80% of 500

$$=\frac{80}{100}\times500=400$$

400 students did not like red colour.

(v) Students liked pink or blue = students liked pink + students liked blue.

= 30% of 500 + 25% of 500 = $\frac{30}{100} \times 500 + \frac{25}{100} \times 500$ = 150 + 125 = 275

(vi) Total number of students = 500

500 students were asked about their favourite colour.

Items	Vegetables	Meat	Salad	Fruits	Sprouts	Bread
No.of people	160	90	80	50	30	40

Question 6.

A survey gives the following information of food items preferred by people. Draw a Pie chart.

Central angle of a component

= Value of the component Total value ×360

Answer:

Total number of people = 160 + 90 + 80 + 50 + 30 + 40 = 450Converting the number of people prefer various food items into components part of 360°

Number of people	Central angle
160	$\frac{160}{450} \times 360^{\circ} = 128^{\circ}$
90	$\frac{90}{450} \times 360^\circ = 72^\circ$
80	$\frac{80}{450} \times 360^\circ = 64^\circ$
50	$\frac{50}{450} \times 360 = 40^{\circ}$
	Number of people 160 90 80 50

Item	Number of people	Central angle
Sprouts	30	$\frac{30}{450} \times 360^\circ = 24^\circ$
Bread	40	$\frac{40}{450} \times 360^\circ = 32^\circ$
Total	450	360°

Food items are preferred by people.



Question 7.

Income from various sources for Government of India from a rupee is given below. raw a pie chart.

Source	Corporation	Income	Customs	Excise	Service	Others
	tax	tax		duties	Tax	
Income (in paise)	19	16	9	14	10	32

Answer:

Source	Income Tax (in paise)	Central angle
Carporation tax	19	$\frac{19}{100} \times 360^\circ = 68.4^\circ$
Income tax	16	$\frac{16}{100} \times 360^\circ = 57.6^\circ$
Customs	9	$\frac{9}{100} \times 360^\circ = 32.4^\circ$
Excise duty	14	$\frac{14}{100} \times 360^\circ = 50.4^\circ$
Service tax	10	$\frac{10}{100} \times 360^\circ = 36^\circ$
Others	32	$\frac{32}{100} \times 360^\circ = 115.2^\circ$
Total	100	360°

Income from various sources for Government of India in a rupee.



Question 8.

Monthly expenditure of Kumaran's family is given below. Draw a suitable Pie chart.

Particulars	Food	Education	Rent	Transport	Miscellaneous
Expenses (in %)	50 %	20 %	15 %	5 %	10 %

Also

1. Find the amount spent for education if Kumaran spends ₹ 6000 for Rent.

2. What is the total salary of Kumaran?

3. How much did he spend more for food than education?

Answer:

Particulars	Expenses (in %)	Central angle
Food	50%	$\frac{50}{100} \times 360^\circ = 180^\circ$
Education	20%	$\frac{20}{100} \times 360^\circ = 72^\circ$
Rent	15%	$\frac{15}{100} \times 360^\circ = 54^\circ$
Transport	5%	$\frac{5}{100} \times 360^{\circ} = 18^{\circ}$
Miscellaneous	10%	$\frac{10}{100} \times 360^\circ = 36^\circ$
Total	100%	360°

Monthly expenditure of kumaran's family.



1. Given Kumaran spends ₹ 6000 for Rent. ∴ 15% of' total expenditure = 6000 $\frac{15}{100}$ (Total Expenditure) = 6000 Total Expenditure = $\frac{6000 \times 100}{15}$ Total Expenditure = ₹ 40,000 Amount spend l'or education = 20% of total expenditure. $\frac{20}{100} \times 40,000$ = ₹ 8000

2. Total salary of Kumaran = ₹ 40,000

3. Amount spend for food = 50% of (40,000) Amount spend for the food than education = 20,000 - 8,000= ₹ 12,000

Ex 6.2

Question 1.Which of the following data can be represented in a histogram?
(i) The number of mountain climbers in the age group 20 to 60 in TamilNadu.Answer:
Yes(ii) Production of cycles in different years.
Answer:
No(iii) The number of students in each class of a school.Answer:
No

(iv) The number votes polled from 7 am to 6 pm in an election. **Answer:**

Yes

(v) The wickets fallen from 1 over to 50th over in a one day cricket match. **Answer:**

Yes

Question 2. Fill in the blanks: (i) The total area of the histogram is _____ to the total frequency of the given data. Answer: proportional

(ii) A graph that displays data that changes continuously over the periods of time is

Answer: Histogram

(iii) Histogram is a graphical representation of_____ data. Answer: grouped

Question 3.

In a village, there are 570 people who have cell phones. An NGO survey their cell phone



usage. Based on this survey a histogram is drawn. Answer the following Questions.

(i) How many people use the cell phone for less than 3 hours? **Answer:**

330 people (110 + 220)

(ii) How many of them use the cell phone for more than 5 hours?Answer:150 of them (100 + 50)

(iii) Are people using cell phone for less than 1 hour? Answer: No

Question 4.

Draw a histogram for the following data.

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	5	15	23	20	10	7

Answer:

The given (tata IS continuous frequency distribution taking class intervals on X axis and No. of students on Y-axis, the histogram is given below.



Question 5.

Construct a histogram from the following distribution of total marks of 40 students in a class.

Marks	90-110	110-130	130-150	150-170	170-190	190-210
No. of Students	9	5	10	7	4	6

Answer:

The given distribution is continuous taking marks on X axis and No. of students on Y-axis the histogram is constructed.



Question 6.

The distribution of heights (in cm) of loo people is given below. Construct a histogram and the frequency polygon imposed on it.

Height (in cm)	125-135	136-146	147-157	158-168	169-179	180-190	191-201
Frequency	12	22	18	24	15	7	2

Answer:

The given distribution is discontinuous.

Converting into continuous distribution we have

Lower boundary = lower limit $-\frac{1}{2}$ (gap between adjacent class interval)

$$= 125 - \frac{1}{2}(1) = 124.5$$

Upper boundary = Upper limit + $\frac{1}{2}$ (gap between the adjacent class interval)

$$= 135 + \frac{1}{2} = 135.5$$

 \therefore The new frequency table is



Question 7.

In a study of dental problem, the following data were obtained.

Ages	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of patients	5	13	25	14	30	35	43	50

Represent the above data by a frequency polygon. **Answer:**

Finding the midpoints of the class interval we get.

Ages	Mid point (x)	No. of patients
0 - 10	5	5
10 - 20	15	13
20 - 30	25	25
30 - 40	35	14
40 - 50	45	30
50 - 60	55	35

60 - 70	65	43
70 - 80	75	50

The points tobe plotted are A(5,5), B(15, 13), C(25, 25), D(35, 14), E(45, 30), G(65, 43.), H(75, 50) to obtain the frequency polygon ZABCDEFGHI. Where I imagined class between 80 and 90.



Question 8.

The marks obtained by 50 students in Mathematics are given below (j) Make a frequency distribution table taking a class size of 10 marks (ii) Draw a histogram and a frequency polygon.

52	33	56	52	44	59	47	61	49	61
47	52	67	39	89	57	64	58	63	65
32	64	50	54	42	48	22	37	59	63
36	35	48	48	55	62	74	43	41	51
08	71	30	18	43	28	20	40	58	49

Answer:

Maximum marks obtained = 89Minimum marks obtained = 08Range = Maximum marks – Minimim marks = 89 - 08= 81Taking the class size = 10, then

Number of possible intervals = $\frac{\text{Range}}{\text{Class size}}$

$$=\frac{81}{10}=8.1=9$$

Class Intervals	Tally marks	Frequency
0-10		1
10-20		1
20-30		3
30-40		8
40-50	$ \mathcal{M}\mathcal{M} $	13
50-60	++	12
60-70		9
70-80		2
80-90		1
Total	50	50

Now we have the continuous frequency table.

Class intervals	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	1	1	3	8	13	12	9	2	1

We will draw the histogram taking class interval in x-axis and frequency in y-axis as



Objective Type Questions

Question 9.

Data is a collection of _____

- (A) numbers
- (B) words
- (C) measurements
- (D) all the three

Answer:

(D) all the three

Question 10.

The number of times an observation occurs in the given data is called ______

- (A) tally marks
- (B) data
- (C) frequency
- (D) none of these

Answer:

(C) frequency

This age difference calculator lets you quickly determine the age gap between two people.

Question 11.

The difference between the largest value and the smallest value of the given data is _____ (A) range

- (B) frequency
- (C) variable
- (D) none of these

Answer:

(A) range

Question 12.

The data that can take values between a certain range is called_____

- (A) ungrouped
- (B) grouped
- (C) frequency
- (D) none of these

Answer:

(B) grouped

Question 13.

Inclusive series is a _____series.

- (A) continuous
- (B) discontinuous
- (C) both
- (D) none of these

Answer:

(B) discontinuous

Question 14.

In a class interval the upper limit of one class is the lower limit of the other class. This is series.

- (A) Inclusive
- (B) exclusive
- (C) ungrouped
- (D) none of these

Answer:

(B) exclusive

Question 15.

The graphical representation of ungrouped data is _____

- (A) histogram
- (B) frequency polygon
- (C) pie chart
- (D) all the three

Answer:

(C) pie chart

Question 16.

Histogram is a graph of a _____ frequency distribution.
(A) continuous
(B) discontinuous
(C) discrete
(D) none of these
Answer:
(A) continuous

Question 17.

A ______ is a line graph for the graphical representation of the continuous frequency distribution.

- (A) frequency polygon
- (B) histogram
- (C) pie chart
- (D) bar graph

Answer:

(A) frequency polygon

Question 18.

The graphical representation of grouped data is _____ (A) bar graph

- (B) pictograph
- (C) pie chart
- (D) histogram

Answer:

(D) histogram

Ex 6.3

Miscellaneous Practice Problems

Question 1.

Draw a pie chart for the given table.

Continent	Asia	Africa	North America	South America	Europe	Australia	Antarctica
Area	30 %	20 %	16 %	12 %	7 %	6 %	9 %

Answer:

Converting the area in percentage into components parts of 360°. we have.

Continent	Area (in %)	Central angle
Asia	30%	$\frac{30}{100} \times 360^\circ = 108^\circ$
Africa	20%	$\frac{20}{100} \times 360^\circ = 72^\circ$
North America	16%	$\frac{16}{100} \times 360^\circ = 57.6^\circ$
South America	12%	$\frac{12}{100} \times 360^\circ = 43.2^\circ$
Europe	7%	$\frac{7}{100} \times 360^\circ = 25.2^\circ$
Australia	6%	$\frac{6}{100} \times 360^\circ = 21.6^\circ$
Antarctica	9%	$\frac{9}{100} \times 360^\circ = 32.4^\circ$
Total	100%	360°

Continental Area.



Question 2.

The data on modes of transport used by the students to come to school are given below. Draw a pie chart for the data.

Mode of transport	Bus	Cycle	Walking	Scooter	Car
Percentage of students	40 %	30 %	15 %	10 %	5 %

Answer:

Converting the percentage into components parts of 360°. we have

Mode of Transport	Percentage of students	Central angle
Bus	40%	$\frac{40}{100} \times 360^{\circ} = 144^{\circ}$
Cycle	30%	$\frac{30}{100} \times 360^\circ = 108^\circ$
Walking	15%	$\frac{15}{100} \times 360^\circ = 54^\circ$
Scooter	10%	$\frac{10}{100} \times 360^\circ = 36^\circ$
Car	10%	$\frac{5}{100} \times 360^\circ = 18^\circ$
Total	100%	360°

Mode of Transport by students.



Question 3.

Draw a histogram for the given frequency distribution.

Age	41-45	46-50	51-55	56-60	61-65	66-70	71-75
Frequency	4	9	17	25	15	8	2

Answer:

The given distribution is discontinuous.

Lower boundary = lower limit $-\frac{1}{2}$ (gap between the adjacent class interval)

$$=41-\frac{1}{2}(1)=40.5$$

Upper boundary = Upper limit + $\frac{1}{2}$ (gap between the adjacent class interval)

$$=45+\frac{1}{2}(1)=45.5$$

Now continuous frequency table is as below

· Age	40.5-45.5	45.5-50.5	- 50.5-55.5	55.5-60.5	60.5-65.5	65.5-70.5	70.5-75.5
Frequency	4	9	17	25	15	8	2

Question 4.

Draw a histogram and the frequency polygon in the same diagram to represent the following data.

Weight (in kg)	50-55	56-61	62-67	68-73	74-79	80-85	86-91
No.of persons	15	8	12	17	9	10	6

Answer:

The given distribution is discontinuous.

Lower boundary = lower limit $-\frac{1}{2}$ (gap between the adjacent class interval)

$$=50 - \frac{1}{2}(1) = 49.5$$

Upper boundary = Upper limit + $\frac{1}{2}$ (gap between the adjacent class interval)

$$=55+\frac{1}{2}(1)=55.5$$

 \therefore The continuous frequency table is as below.

Weight (in kg)	49.5-55.5	55.5-61.5	61.5-67.5	67.5-73.5	73.5-79.5	79.5-85.5	85.5-91.5
No. of persons	15	8	12	17	9	10	6

Challenging problems

Question 5.

Form a continuous frequency distribution table and draw histogram from the following data.

	Age (in years)		No of persons
Under 5		1	
Under 10		12	
Under 15		19	
Under 20		26	
Under 25		27	
Under 30		35	
Under 35		38	
Under 40		45	
Under 45		48	

Under	50
onaor	00

Answer:

Converting into continuous distribution we have

Class interval	No. of persons
0 – 5	1
5 - 10	11
10 – 15	7
15 – 20	7
20 – 25	1
25 - 30	8
30 - 35	3
35 - 40	7
40 - 45	3
45 - 50	5
Total	53

Question 6.

A rupee spent in a cloth manufacturing company is distributed as follows. Represent this in a pie chart.

Part	ticulars	Paise
Farmer	20	
Spinner	35	
Dyer	15	
Weaver	15	
Printer	05	
Salary	10	

Answer:

1 Rupee = 100 paise.

Particulars	Paise	Central angle
Farmer	20	$\frac{20}{100} \times 360^\circ = 72^\circ$
Spinner	34	$\frac{34}{100} \times 360^\circ = 122.4^\circ$
Dyer	12	$\frac{12}{100} \times 360^\circ = 43.2^\circ$
Weaver	14	$\frac{14}{100} \times 360^\circ = 50.4^\circ$
Printer	09	$\frac{09}{100} \times 360^\circ = 32.4^\circ$
Salary	11	$\frac{11}{100} \times 360^\circ = 39.6^\circ$
Total	100%	360°

Expenditure of a cloth manufacturing company.

Question 7.

Draw a histogram for the following data.

Mid Value (x)	15	25	35	45	55	65	75
Frequency (f)	12	24	30	18	26	10	8

Answer:

Since mid values are given, the given distributors is discontinuous.

Lower boundary lower limit $-\frac{1}{2}$ (gap between the adjacent class interval)

$$=15-\frac{1}{2}(10)=10$$

Upper boundary = Upper limit + (gap between the adjacent class interval)

$$=15+\frac{1}{2}(10)=20$$

The continuous distribution will he as follows.

Class interval	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	12	24	30	18	26	10	8

