Chapter 22: Tabular Representation of Statistical Data

Exercise 22-1

1) What do you understand by the word 'statistics' in
   i) singular form ii) plural form

→ As we know that the word 'statistics' is used in two forms which has two different meanings given below.

i) Singular form:
When the word 'statistics' is used in singular form which gives information about science of collection, presentation, analysis and interpretation of numerical data also.

ii) Plural form:
When the word 'statistics' is used in plural form it gives information about numerical facts or observed collected date for definite purpose.

2) Describe some fundamental characteristics of statistics.

→ The fundamental characteristics of statistics are as given below

1) Statistics is for collecting data for definite purpose.
2) Expressions of statistics are given quantitatively not qualitatively always.
3) The experiments related to statistics are comparable & they can be differentiated into different groups also.

3) What are i) Primary data
ii) Secondary data
Which of the two- the primary or the secondary data- is more reliable & why?

→ i) Primary data:

Primary data is the data which is collected by investigator & which is raw data taken with definite plan without using the sources which are available or existed.

ii) Secondary data:

Secondary data is the data which is collected from other published or unpublished sources.

- Secondary data is the data which is collected by an individual person or by institution for particular purpose & it is used by other person in another form.
- Since primary date is most reliable & relevant also because it is originally generated which collected by some person individually or by research bodies.

4) Why do we group data?

→ The original form of data is called as raw data. But to get information from raw data is very difficult & sometimes confusing also. So to overcome that problem data is group so that it becomes understandable & hence interpreted easily.

- Because of group data available we will make calculations of certain values easily to describe & analyse the data.

5.) Explain the meaning of following terms.
i) Variate ii) Class-interval iii) Class-size iv) Class-mark
v) Frequency vi) Class limits vii) True class limits.

→ i) Variate:
Variate is that type of any character which may vary from one individual to other individual.

ii) Class-interval:
Class-interval is the raw data considered from each data group.

iii) Class-size:
Class-size is nothing but the difference betn upper limit & lower limit.

iv) Class-mark:
Class-mark is the middle value of the selected class & it is calculate by using formula
Class-mark = (Upper limit + Lower limit)/2

v) Frequency:
The total no. of observations taken corresponding to class is called as frequency.

vi) Class Limits:
Each class has two figures called as class limits. The figure which is present on the right side is called as upper limit and the figure present on the left side is called as lower limit.

6.) The ages of ten students of a group are given below. The ages have been recorded in years & months.

8-6, 9-0, 8-4, 9-3, 7-8, 8-11, 8-7, 9-2, 7-10, 8-8

i) What is the lowest age?

ii) What is the highest age?

iii) Determine the range?

→ Here given that,

The ages of ten students of a group which are recorded in years & months as given below:

8-6, 9-0, 8-4, 9-3, 7-8, 8-11, 8-7, 9-2, 7-10, 8-8.

i) Lowest age ⇒ 7 years 8 months

ii) Highest age ⇒ 9 years 3 months

iii) Range = Highest age − Lowest age

= (9 years 3 months) − (7 years 8 months)

Range = 1 year 7 months

7.) The monthly pocket money of six friends is given below:

Rs 45, Rs 30, Rs 40, Rs 50, Rs 25, Rs 45.

i) What is the highest pocket money?

ii) What is the lowest pocket money?

iii) What is the range?

iv) Arrange the amounts of pocket money in ascending order.

→ Here, the monthly pocket money of six friends is given as: Rs 45, Rs. 30, Rs. 40, Rs. 50, Rs. 25, Rs. 45.

i) Highest pocket money is found to be Rs. 50

ii) Lowest pocket money is found to be Rs. 25

iii) Range = Heighest pocket money − Lowest pocket money

= Rs. 50 − Rs. 25 = Rs. 25

iv) The ascending order of pocket money in Rs. is found to be Rs. 25, Rs. 30, Rs. 40, Rs. 45, Rs. 45, Rs. 50

5) Write the class-size in each of the following.

i) 0-4, 5-9, 10-14

→ Here given that, 0-4, 5-9, 10-14

As given classes are inclusive, then

True lower limit of class = Lower limit of class − 0.5

And True upper limit of class = Upper limit of class + 0.5

Thus, true class limits are 0.5-4.5, 4.5-9.5, 9.5-14.5

And hence, class size = 14.5 − 9.5 = 5.

ii) 10-19, 20-29, 30-39

→ Here, given that 10-19, 20-29, 30-39

As given classes are inclusive then

True lower limit of class = lower limit of class − 0.5

And, True upper limit of class = upper limit of class + 0.5

Thus, True class limits are 19.5-19.5, 19.5-29.5, 29.5-29.5

And hence, Class size = 39.5 − 29.5 = 10

iii) 100-120, 120-140, 160-180

→ Here, given that 100-120, 120-140, 160-180

Here, the class limits & true class limits are also same.

Then, class size = ~~0.25 − 0 = 0.25~~

= 120 − 100 = 20

v) 5-5.01, 5.01-5.02, 5.02-5.03

→ Given that, 5-5.01, 5.01-5.02, 5.02-5.03

Here true class limits & class limits are same.

Then, class size = 5.01 − 5.0 = 0.01

9.) The final marks in mathematics of 30 students are as follows:

53, 61, 48, 60, 78, 68, 55, 100, 67, 90, 75, 88, 77, 37, 84, 68, 60, 48, 62, 56, 44, 58, 52, 64, 98, 59, 70, 39, 50, 60.

i) Arrange these marks in the ascending order, 30 to 39 one group, 40 to 49 second group etc.

Answer the following:

ii) What is highest score?

iii) What is lowest score?

iv) What is the range?

v) If 40 is the pass mark how many have failed?

vi) How many have scored 75 or more?

vii) Which observations between 50 & 60 have not actually appeared?

viii) How many have scored less than 50?

→ i) We arranged the given marks in ascending order as given below:

Class marks	Observations	Frequency
30 - 39	37, 39	2
40 - 49	44, 48, 48	3
50 - 59	50, 52, 53, 55, 56, 58, 58, 59	8
60 - 69	60, 60, 60, 61, 62, 64, 67, 68	8
70 - 79	70, 75, 77, 78	4
80 - 89	84, 88	2
90 - 99	90, 98	2
100 - 109	100	1

ii) Highest score found is 100.

iii) Lowest score found is 37

iv) Range = Highest score - Lowest score
= 100 - 37

Range = 63

v) If 40 is the pass mark then 2 students may have failed.

vi) 8 students scored 75 or more.

vii) 51, 54, 57 are the observations between 50 & 60 are not actually appeared.

viii) 5 students have scored less than 50.

Q.10.) The weights of the new born babies (in kg) in a hospital on a particular day are are as follows:
2.3, 2.2, 2.1, 2.7, 2.6, 3.0, 2.5, 2.9, 2.8, 3.1, 2.5, 2.8, 2.7, 2.9, 2.4.

i) Rearrange the highest weight
ii) Deteremine the highest weight
iii) Determine the lowest weight
iv) Determine the range.
v) How many babies were born on that day?
vi) How many babies weigh below 2.5 kg?
vii) How many babies weigh more than 2.8 kg?
viii) How many babies weigh 2.8 kg?

→ i) We arranged the weights of the new born babies (in kg) in a hospital on a particular day are as follows:
3.1, 3.0, 2.9, 2.9, 2.8, 2.7, 2.7, 2.6, 2.5, 2.5, 2.4, 2.3, 2.2, 2.1.

ii) Heighest weight found is 3.1 kg.

iii) Lowest weight found is 2.1 kg.

iv) Range found is = 3.1 - 2.1 = 1.0 kg

v) On that particular day, 15 babies were born.

vi) 4 babies weight below 2.5 kg.

vii) 4 babies weight is more than 2.8 kg.

viii) 2 babies weight is 2.8 kg.

11) The number of runs scored by a cricket player in 25 innings is as follows:

26, 35, 94, 48, 82, 105, 53, 0, 39, 42, 71, 0, 64, 15, 34, 15, 34, 6, 71, 0, 64, 15, 34, 15, 34, 67, 0, 42, 124, 84, 54, 48, 139, 64, 47.

i) Rearrange these runs in ascending order

ii) Determine the player, is highest score.

iii) How many times did the player not score a run?

iv) How many centuries did he score?

v) How many times did he score more than 50 runs?

→ i) The no. of runs scored by a cricket player in 25 innings are arranged in ascending order as follows:

0, 0, 0, 0, 6, 15, 15, 15, 15, 26, 34, 34, 34, 34, 35, 39, 42, 42, 47, 48, 48, 53, 54, 64, 64, 64, 67, 71, 71, 82, 84, 90, 94, 124, 139.

ii) The heighest score found to be 139.

iii) The player did not scored any run, 3 times.

iv) He scored 3 centuries

v) 12 time he scored more than 50 runs.

Exercise 22.2

1.) Define cumulative frequency distribution.

→ Cumulative frequency distribution is the distribution in which a table is there which displays the manner in which cumulative frequencies are distributed over various classes.

2.) Explain the difference between a frequency distribution & a cumulative frequency distribution.

→ • Frequency distribution is one of the method in which representation of raw data in the form which one can easily understand the information which is included in the raw data.

• While cumulative frequency distribution is the distribution in which a table is there which displays the manner in which cumulative frequencies are distributed over various classes.

3.) The marks scored by 55 students in a test are given below;

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35
No. of students	2	6	13	17	11	4	2

Prepare a cumulative frequency table.

→

Marks	No. of Students	Marks	Cumulative Frequency
0-5	2	Less than 5	2
5-10	6	Less than 10	8
10-15	13	Less than 15	21
15-20	17	Less than 20	38
20-25	11	Less than 25	49
25-30	4	Less than 30	53
30-35	2	Less than 35	55
	N=55		

The above table shows cumulative frequency table.