

Chapter - 14

(Statistics)

Key Concept

- * There are two types of data (i) Primary (ii) Secondary
- * We can represent the data by (i) ungrouped and grouped frequency distribution.
- * Data can also be represented by (i) bar graph (ii) Histogram (iii) Frequency

polygons

- * Class mark of grouped data is $\frac{\text{lower limit} + \text{upper limit}}{2}$

- * Measure of central tendencies by mean, median, mode.

- * Mean $(\bar{x}) = \frac{\text{sum of all observations}}{\text{Total no. of observations}}$

If observations denoted by x_i and their occurrence i.e. frequency is denoted by f_i then mean is

$$(\bar{x}) = \frac{\sum f_i x_i}{\sum f_i}$$

- * Median: Arrange the observations in ascending or descending order then if numbers of observations (n) are odd then then median is $\frac{n+1}{2}$ th term.

If no. of observations (n) are even then median is average of $\frac{n}{2}$ th and $\frac{n}{2} + 1$ th terms.

- * Mode: The observation whose frequency is greatest.

- * Mode = 3 median - 2 mean.

Section - A

- Q.1 If the mean of 2, 4, 6, 8, x, y is 5 then find the value of x+y.
- Q.2 Write the class mark of 90-110 group.
- Q.3 If the ratio of mean and median of a certain data is 2:3, then find the ratio of its mode and mean.

- Q.4 Tally marks are used to find
- Q.5 The following marks were obtained by the students in a test.
81, 72, 90, 90, 86, 85, 92, 70, 71, 83, 89, 95, 85, 79, 62
What is the range?
- Q.6 In a histogram, each class rectangle is constructed with base as
(a) frequency (b) class interval
(c) range (d) size of the class

Section - B

- Q.7 The mean of 10 numbers is 20, If 5 is subtracted from every number, what will be the new mean.
- Q.8 Find the mean of first 10 even natural no.
- Q.9 Calculate the mean for the following distribution.
- | | | | | | |
|---|---|---|----|----|---|
| x | 5 | 6 | 7 | 8 | 9 |
| f | 4 | 8 | 14 | 11 | 3 |
- Q.10 Find the median of 37, 31, 42, 43, 46, 25, 39, 45, 32
- Q.11 Find the mode of following series.
25, 23, 22, 22, 24, 27, 27, 25, 23, 22, 26, 32
- Q.12 If the median of a series of data is 3 and mean is 2 then find the mode.

Section - C

- Q.13 Find the median of the following data
19, 25, 59, 48, 35, 31, 30, 32, 51. If 25 is replaced by 52, what will be the new median.
- Q.14 If the mean of the following distribution is 6, then find the value of p.
- | | | | | | |
|---|---|---|---|----|-----|
| x | 2 | 4 | 6 | 10 | p+5 |
| f | 3 | 2 | 3 | 1 | 2 |

Q.15 If the mean of five observations $x, x+2, x+4, x+6, x+8$ is 11 find the mean of first three observation.

Q.16 The mean of 5 numbers is 18. If one number is excluded, their mean is 16, find the excluded number.

Q.17 Construct a histogram for the following data:

30-60	60-90	90-120	120-150	150-180
5	12	14	18	10

Q.18 The following observations have been arranged in ascending order. If the median of the data is 63, find the value of x .

29, 32, 48, 50, $x, x+2, 72, 78, 84, 95$

Section - D

Q.19 Find the value of x and y in following distribution if it known that the mean of the distribution is 1.46.

No. of accidents	0	1	2	3	4	5	Total
Frequency	46	x	Y	25	10	5	200

Q.20 The mean monthly salary of 10 members of a group is Rs. 1445, one more member whose monthly salary is Rs. 1500 has joined the group. Find the mean monthly salary of 11 members of the group.

Q.21 Draw a histogram for the marks of students given below.

Marks	0-10	10-30	30-45	45-50	50-60
No. of Student	8	32	18	10	6

Q.22 For the following data, draw a histogram and frequency polygon.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of student	5	10	4	6	7	3	2	2	3	9

Q.23 Given below is a cumulative frequency distribution table showing the age of people living in a locality.

Age in years	No. of persons
Above 108	0
Above 96	1
Above 84	3
Above 72	5
Above 60	20
Above 48	158
Above 36	427
Above 24	809
Above 12	1026
Above 0	1124

Prepare a frequency distribution table.

Question for self evaluation

Q.24 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

Construct a histogram.

Q.25 Construct a frequency polygon for the following data :

Age	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18
Frequency	2	4	6	8	9	6	5	3	1

Q.26 If x_1, x_2, \dots, x_n are n values of a variable X such that

$$\sum_{i=1}^n (x_i - 2) = 110 \text{ and } \sum_{i=1}^n (x_i - 5) = 20 \text{ find the value of } n \text{ and mean.}$$

Q.27 The mean of 200 items was 50. Later on, it was discovered that the two items were misread as 92 and 8 instead of 192 and 88. Find the correct mean.

Q.28 Find the value of p, if the mean of following distribution is 20.

x	15	17	19	20+p	23
frequency	2	3	4	5p	6

Answers :

Q.1 10 Q.2 100 Q.3 5:2 Q.4 Frequency Q.5 33 Q.6 b
 Q.7 15 Q.8 11 Q.9 7.025 Q.10 39 Q.11 22 Q.12 5
 Q.13 32,35 Q.14 7 Q.15 9 Q.16 26 Q.18 62 Q.19 $x=76, y=38$
 Q.20 Rs 1450 Q.23

Age	0-12	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108
Person	98	217	382	269	138	15	2	2	1

Q.26 $n=30, \text{mean} = \frac{17}{3}$

Q.27 50.9 Q.28 1