STATISTICS

MAIN CONCEPTS AND RESULTS

1. The mean for grouped data can be found by :

(i) the direct method : $\bar{x} = \dfrac{\sum f_i x_i}{\sum f_i}$

(ii) the assumed mean method : $\bar{x} = a + \dfrac{\sum f_i d_i}{\sum f_i}$

(iii) the step deviation method : $\bar{x} = a + \left(\dfrac{\sum f_i u_i}{\sum f_i}\right) \times h$,

with the assumption that the frequency of a class is centred at its mid-point, called its class mark.

2. The mode for grouped data can be found by using the formula:

Mode $= l + \left(\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$ where symbols have their usual meanings.

3. The cumulative frequency of a class is the frequency obtained by adding the frequencies of all the classes preceding the given class.

4. The median for grouped data is formed by using the formula:

Median $= l + \left(\dfrac{\frac{n}{2} - cf}{f}\right) \times h$, where symbols have their usual meanings.

QUESTIONS FROM NCERT BOOKS α

1. Consider the following distribution of daily wages of 50 workers of a factory.

Daily wages (in Rs)	100 - 120	120 - 140	140 - 160	160 - 180	180 - 200
Number of workers	12	14	8	6	10

Find the mean daily wages of the workers of the factory.

2. The following distribution shows the daily pocket allowance of children of a locality.The mean pocket allowance is Rs 18. Find the missing frequency *f*.

Daily pocket allowance (in Rs)	11 - 13	13 - 15	15 - 17	17 - 19	19 - 21	21 - 23	23 - 25
Number of children	7	6	9	13	*f*	5	4

3. In a retail market, fruit vendors were selling mangoes kept in packing boxes. These boxes contained varying number of mangoes. The following was the distribution of mangoes according to the number of boxes.

Number of mangoes	50 - 52	53 - 55	56 - 58	59 - 61	62 - 64
Number of boxes	15	110	135	115	25

Find the mean number of mangoes kept in a packing box.

4. The following table shows the ages of the patients admitted in a hospital during a year:

Age (in years)	5 - 15	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65
Number of patients	6	11	21	23	14	5

Find the mode and the mean of the data given above. Compare and interpret the two measures of central tendency.

5. A student noted the number of cars passing through a spot on a road for 100 periods each of 3 minutes and summarised it in the table given below. Find the mode of the data :

Number of cars	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
Frequency	7	14	13	12	20	11	15	8

6. The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the median, mean and mode of the data and compare them.

Monthly consumption (in units)	Number of consumers
65 - 85	4
85 - 105	5
105 - 125	13
125 - 145	20
145 - 165	14
165 - 185	8
185 - 205	4

7. If the median of the distribution given below is 28.5, find the values of x and y.

Class interval	Frequency
0 - 10	5
10 - 20	x
20 - 30	20
30 - 40	15
40 - 50	y
50 - 60	5
Total	60

8. A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to persons having age 18 years onwards but less than 60 year.

Age (in years)	Number of policy holders
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98
Below 60	100

9. 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabets in the surnames was obtained as follows:

Number of letters	1 - 4	4 - 7	7 - 10	10 - 13	13 - 16	16 - 19
Number of surnames	6	30	40	16	4	4

ANSWERS

1. Rs 145.20 **2.** $f = 20$ **3.** 57.19 **4.** Mode = 36.8 years, Mean = 35.37 years. **5.** Mode = 44.7 cars

6. Median = 137 units, Mean = 137.05 units, Mode = 135.76 units. **7.** x = 8, y = 7 **8.** Median age = 35.76 years **9.** Median = 8.05, Mean = 8.32, Modal size = 7.88