Stats day 1

EXERCISE - 14.1

1. A survey was conducted by a group of students as a part of their environment awareness programme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

Number of plants	0 - 2	2 - 4	4 – 6	6 - 8	8 - 10	10 - 12	12 – 14
Number of houses	1	2	1	5	6	2	3

1.

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

Daily wages in Rupees	200 - 250	250 - 300	300 - 350	350 - 400	400– 450
Number of workers	12	14	8	6	10

Find the mean daily wages of the workers of the factory by using an appropriate method.

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

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

4. Thirty women were examined in a hospital by a doctor and their heart beats per minute were recorded and summarised as shown. Find the mean heart beats per minute for these women, choosing a suitable method.

Number of heart beats/minute	65-68	68-71	71-74	74-77	77-80	80-83	83-86
Number of women	2	4	3	8	7	4	2

5. In a retail market, fruit vendors were selling oranges kept in packing baskets. These baskets contained varying number of oranges. The following was the distribution of oranges.

Number of oranges	10-14	15–19	20-24	25-29	30–34
Number of baskets	15	110	135	115	25

Find the mean number of oranges kept in each basket. Which method of finding the mean did you choose?

2.

8. A class teacher has the following attendance record of 40 students of a class for the whole term. Find the mean number of days a student was present out of 56 days in the term.

Number of days	35-38	38-41	41-44	44-47	47-50	50-53	53-56
Number of students	1	3	4	4	7	10	11

9. The following table gives the literacy rate (in percentage) of 35 cities. Find the mean literacy rate.

Literacy rate in %	45–55	55-65	65-75	75-85	85-95
Number of cities	3	10	11	8	3

3.

EXERCISE - 14.2

1. The following table shows the ages of the patients admitted in a hospital on a particular day:

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.

2. The following data gives the information on the observed life times (in hours) of 225 electrical components :

Lifetimes (in hours)	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	100 - 120
Frequency	10	35	52	61	38	29

Determine the modal lifetimes of the components.

3. The following data gives the distribution of total monthly household expenditure of 200 families of Gummadidala village. Find the modal monthly expenditure of the families. Also, find the mean monthly expenditure :

Expenditure (in rupees)	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000
Number of families	24	40	33	28	30	22	16	7

4.

EXERCISE - 14.3

1. 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	65-85	85-105	105-125	125-145	145-165	165-185	185-205
Number of consumers	4	5	13	20	14	8	4

2. If the median of 60 observations, given below is 28.5, find the values of x and y.

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

3. A life insurance agent found the following data about distribution of ages of 100 policy holders. Calculate the median age. [Policies are given only to persons having age 18 years onwards but less than 60 years.]

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

5.

6. 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabet 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

Determine the median number of letters in the surnames. Find the mean number of letters in the surnames? Also, find the modal size of the surnames.

7. The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

Weight (in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
Number of students	2	3	8	6	6	3	2

6.

1. The mean for grouped data is calculated by :

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

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

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

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

   $$\text{Mode} = l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$$

   where, symbols have their usual meaning.

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

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

4. In order to find median, class intervals should be continuous.

5. Representing a cumulative frequency distribution graphically as a cumulative frequency curve, or an ogive of the less than type and of the more than type.

6. While drawing ogives, boundaries are taken on X-axis and cumulative frequencies are taken on Y-axis.

7. Scale on both the axes may not be equal.

8. The median of grouped data can be obtained graphically as the x-coordinate of the point of intersection of the two ogives for this data.

ans: (match the question num from the exercises and check the ans)

EXERCISE - 14.1

1. 8.1 plants. We have used direct method because numerical values of x_i and f_i are small.

2. ₹ 313 3. $f = 20$ 4. 75.9

5. 22.31 6. ₹ 211 7. 0.099 ppm

8. 49 days 9. 69.43%

EXERCISE - 14.2

1. Mode = 36.8 years, Mean = 35.37 years, Maximum number of patients admitted in the hospital are of the age 36.8 years (approx.), while on an average the age of a patient admitted to the hospital is 35.37 years.

2. 65.625 hours

3. Modal monthly expenditure = ₹ 1847.83, Mean monthly expenditure = ₹ 2662.5.

EXERCISE - 14.3

1. Median = 137 units, Mean = 137.05 units, Mode = 135.76 units.

   The three measures are approximately the same in this case.

2. $x = 8, y = 7$

3. Median age = 35.76 years

4. Median length = 146.75 mm

5. Median life = 3406.98 hours

6. Median = 8.05, Mean = 8.32, Modal size = 7.88

7. Median weight = 56.67 kg