Short Answer Type Questions – I

[2 marks]

Que 1. If x_i's are the mid-point of the class intervals of a grouped data. F_i's are the corresponding frequencies and $\overline{x}$ is the mean, then find $\Sigma f_i (x_i - \overline{x})$.

Sol. We know mean $(\overline{x}) = \frac{\Sigma f_i x_i}{\Sigma f_i}$

$\therefore \quad \Sigma f_i x_i = \overline{x} \Sigma f_i \quad \ldots(i)$

Now the value of $\Sigma f_i (x_i - \overline{x}) = \Sigma f_i x_i - \Sigma f_i \overline{x}$

$= \Sigma f_i \overline{x} - \Sigma f_i \overline{x} = 0.$ [Using (i)]

Que 2. Consider the following frequency distribution.

Class	0 – 5	6 – 11	12 – 17	18 – 23	24 – 29
Frequency	13	10	18	8	11

Find the upper limit of median class.

Sol. Classes are not continuous, hence make them continuous by adding 0.5 to the upper limits and subtracting 0.5 from the lower limits.

C.I.	**Frequency**	**Cumulative Frequency**
0 – 5.5	13	13
5.5 – 11.5	10	23
11.5 – 17.5	15	38
17.5 – 23.5	08	46
23.5 – 29.5	11	57
Total	**$\Sigma f = 57$**	

Class interval can't be negative hence the first C.I. is starting from 0.

Now to find median we calculate $\frac{\Sigma f}{2} = \frac{57}{2} = 28.5$

$\therefore$ Median class 11.5 – 17.5
So, the upper limit is 17.5

Que 3. Find the median class of the following distribution:

Classes	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	4	4	8	10	12	8	4

Sol. First we find the cumulative frequency

Classes	**Frequency**	**Cumulative Frequency**
0 – 10	4	4
10 – 20	4	8
20 – 30	8	16
30 – 40	10	26
40 – 50	12	38
50 – 60	8	46
60 – 70	4	50
Total	50	

$Here, \frac{n}{2} = \frac{50}{2} = 25$

∴ Median class = 30 – 40.

Que 4. Find the class marks of classes 15.5 – 18.5 and 50 – 75.

Sol. Class marks = $\frac{upper\ limit + lower\ limit}{2}$

∴ Class marks of 15.5 – 18.5 = $\frac{18.5+15.5}{2} = \frac{34}{2} = 17$

Class marks of 50 – 75 = $\frac{75+50}{2} = \frac{125}{2} = 62.5$.