



Exercise 9B

Question 7:

The frequency table is given below. Let the missing frequency be x .

Class	Frequency f_i	C.F
0 - 10	5	5
10 - 20	25	30
20 - 30	x	$30 + x$
30 - 40	18	$48 + x$
40 - 50	7	$55 + x$

Median = 24 \Rightarrow Median class is 20 - 30

$$\left(\frac{N}{2}\right) = \left(\frac{55+x}{2}\right) = 27.5 + \frac{x}{2}$$

$l = 20, h = 10, f = x, c = \text{C.F. preceding median class} = 30$

$$\begin{aligned} \text{Median} &= l + \left[h \times \frac{\left(\frac{N}{2} - c\right)}{f} \right] \\ \Rightarrow 24 &= 20 + \left[10 \times \frac{\left(27.5 + \frac{x}{2} - 30\right)}{x} \right] \\ 24 &= 20 + \left[10 \times \frac{\left(\frac{x}{2} - 2.5\right)}{x} \right] \\ 24x &= 20x + 5x - 25 \\ 0 &= x - 25 \quad \therefore x = 25 \end{aligned}$$

Hence, the missing frequency is 25.

Question 8:

Let f_1 and f_2 be the frequencies of classes 20 - 30 and 40 - 50 respectively, then

$$10 + 20 + f_1 + 40 + f_2 + 25 + 15 = 170$$

$$\Rightarrow f_1 + f_2 = 60$$

Median is 35, which lies in 30 - 40, so the median class is 30 - 40.

$$l = 30, h = 10, f = 40, N = 170 \text{ and } c = 10 + 20 + f_1 = (30 + f_1)$$

$$\text{Now, median } m_e = l + \left[h \times \frac{\left(\frac{N}{2} - c \right)}{f} \right]$$

$$\Rightarrow 35 = \left[30 + \left(10 \times \frac{85 - (30 + f_1)}{40} \right) \right]$$

$$\Rightarrow 35 = 30 + \left(\frac{55 - f_1}{4} \right)$$

$$\Rightarrow 5 = \left(\frac{55 - f_1}{4} \right)$$

$$\Rightarrow 55 - f_1 = 20$$

$$\Rightarrow f_1 = 35$$

$$\therefore f_1 = 35 \text{ and } f_2 = (60 - 35) = 25$$

***** END *****