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 = C.F. preceding median class = 30

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

$$\Rightarrow 24 = 20 + \left[10 \times \frac{\left(27.5 + \frac{x}{2} - 30\right)}{x}\right]$$

$$24 = 20 + \left[10 \times \frac{\left(\frac{x}{2} - 2.5\right)}{x}\right]$$

$$24x = 20x + 5x - 25$$

$$0 = x - 25 \quad \therefore x = 25$$

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 and c = 10 + 20 + f_1 = (30 + f_1)

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

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

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

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

$\Rightarrow 55 - f_1 = 20$
$\Rightarrow \quad f_1 = 35$
$\therefore f_1 = 35$ and $f_2 = (60 - 35) = 25$

********** END **********