Exercise 14F

Question 8:

Let f_1 and f_2 be the missing frequencies.

We prepare the following frequency distribution table.

(X_i)	(f_i)	f_ix_i
10	17	170
30	f_1	$30f_1$
50	32	1600
70	f_2	$70f_2$
90	19	1710
Total	120	$3480 + 30f_1 + 70f_2$

Here,

$\sum f_i = 68 + f_1 + f_2$

But $68 + f_1 + f_2 = 120$ (Given)

Therefore,
$68 + f_1 + f_2 = 120$

$\Rightarrow f_1 + f_2 = 120 - 68 = 52$

Thus, $f_2 = 52 - f_1$ .....(1)

Also,

$$\text{Mean} = \frac{\sum f_i x_i}{\sum f_i} = \frac{3480 + 30f_1 + 70f_2}{120}$$

$$= \frac{3480 + 30f_1 + 70(52 - f_1)}{120} \quad \text{using equation 1}$$

$$= \frac{3480 + 30f_1 + 3640 - 70f_1}{120}$$

$$= \frac{7120 - 40f_1}{120}$$

But mean = 50 (given)

Therefore, we have,

$$50 = \frac{7120 - 40f_1}{120}$$

$$6000 = 7120 - 40f_1$$

$$40f_1 = 1120$$

$$f_1 = \frac{1120}{40} = 28$$

Substituting the value of f_1 in equation 1, we have,

$f_2 = 52 - 28 = 24$

Thus, the missing frequencies are $f_1 = 28$ and $f_2 = 24$ respectively.

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