Statistics Ex 7.5 Q17

Answer :

Consider the following table.

Daily income (in Rs.)	Number of workers (f_i)	x_i	$f_i x_i$	C.f.
100–120	12	110	1320	12
120–140	14	130	1820	26
140–160	8	150	1200	34
160–180	6	170	1020	40
180–200	10	190	1900	50
	$N = \sum f = 50$		$\sum f_i x_i = 7260$	

Here, the maximum frequency is 14 so the modal class is 120–140.

Therefore,

$l = 120$

$h = 20$

$f = 14$

$f_1 = 12$

$f_2 = 8$

$F = 12$

$$\text{Mean} = \frac{\sum f_i x_i}{\sum f}$$

$$= \frac{7260}{50}$$

$$\boxed{\text{Mean} = 145.20}$$

Thus, the mean daily income of the workers is Rs 145.20.

$$\text{Median} = l + \frac{\frac{N}{2} - F}{f} \times h$$

$$= 120 + \frac{25 - 12}{14} \times 20$$

$$= 120 + \frac{13}{14} \times 20$$

$$= 120 + \frac{130}{7}$$

$$\boxed{\text{Median} = 138.57}$$

Thus, the median of the daily income of the workers is Rs 138.57.

$$\text{Mode} = l + \frac{f - f_1}{2f - f_1 - f_2} \times h$$

$$= 120 + \frac{2}{8} \times 20$$

$$= 120 + 5$$

$$\boxed{\text{Mode} = 125}$$

Thus, the mode of the daily income of the workers is Rs 125.

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