



Exercise 9D

Question 3:

Let the assumed mean A be 145. Class interval $h = 10$.

Class	Frequency f_i	Mid-Value x_i	$u_i = \left(\frac{x_i - A}{h}\right)$	$f_i u_i$	C.F.
120-130	2	125	-2	-4	2
130-140	8	135	-1	-8	10
140-150	12	145=A	0	0	22
150-160	20	155	1	20	42
160-170	8	165	2	16	50
	$N = 50$			$\sum f_i u_i = 24$	

$$(i) \text{Mean } \bar{x} = A + h \left(\frac{\sum f_i u_i}{N} \right) = 145 + 10 \times \left(\frac{24}{50} \right)$$

$$= 145 + 4.8 = 149.8$$

$$(ii) N = 50, \therefore \frac{N}{2} = \frac{50}{2} = 25$$

Cumulative frequency just after 25 is 42

Corresponding median class is 150 - 160

Cumulative frequency before median class, $c = 22$

Median class frequency $f = 20$

$$\begin{aligned} \text{Median } M_e &= l + h \left(\frac{\frac{N}{2} - c}{f} \right) = 150 + 10 \times \left(\frac{25 - 22}{20} \right) \\ &= 150 + \frac{10 \times 3}{20} = 150 + 1.5 = 151.5 \end{aligned}$$

$$\begin{aligned} (iii) \text{Mode} &= 3 \times \text{median} - 2 \times \text{mean} \\ &= 3 \times 151.5 - 2 \times 149.8 = 454.5 - 299.6 \\ &= 154.9 \end{aligned}$$

Thus, Mean = 149.8, Median = 151.5, Mode = 154.9

***** END *****