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_iu_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			$\Sigma f_iu_i = 24$	

(i) Mean $\bar{x} = A + h\left(\frac{\Sigma f_iu_i}{N}\right) = 145 + 10 \times \left(\frac{24}{50}\right)$

$= 145 + 4.8 = 149.8$

(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

$$\text{Median } M_e = l + h\left(\frac{\frac{N}{2} - c}{f}\right) = 150 + 10 \times \left(\frac{25 - 22}{20}\right)$$

$$= 150 + \frac{10 \times 3}{20} = 150 + 1.5 = 151.5$$

(iii) Mode = 3 × median - 2 × mean
= 3 × 151.5 - 2 × 149.8 = 454.5 - 299.6
= 154.9
Thus, Mean = 149.8, Median = 151.5, Mode = 154.9

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