Exercise 14H

Question 8:

We may prepare the table, given below:

(x)	Frequency(f)	Cumulative Frequency	$f \times x$
18	6	6	108
20	7	13	140
25	3	16	75
30	7	23	210
34	7	30	238
38	5	35	190
40	5	40	200
	$\sum f = 40$		$\sum f \times x = 1161$

Here, N = 40, which is even .

$$\text{Median} = \frac{1}{2}\left[\left[\left(\frac{n}{2}\right)\right]\text{th term} + \left(\frac{n}{2}+1\right)\text{th term}\right]$$

$$= \frac{1}{2}\left[(20\text{th term} + 21\text{st term})\right] [\because n = 40]$$

$$= \frac{1}{2}(30+30) = \left(\frac{1}{2} x 60\right) = 30$$

Now, $\sum f \times x = 1161$ and $\sum f = 40$

$$\therefore \quad \text{mean} = \frac{\sum f \times x}{\sum f} = \frac{1161}{40} = 29.025$$

Mode = 3(median)-2(mean)
=(3x30)-(2x29.025)
= (90-58.05)=31.95.
Thus, mode = 32.

Question 9:

We may prepare the table, given below:

Weight (in kg)	No of persons(f)	Cumulative Frequency	$f \times x$
42	3	3	126
47	8	11	376
52	6	17	312
57	8	25	456
62	11	36	682
67	5	41	335
72	9	50	648
	$\sum f = N = 50$		$\sum f \times x = 2935$

Here, $\sum f \times x = 2935, \text{and } \sum f = 50$

$$\text{mean} = \frac{\sum f \times x}{\sum f} = \frac{2935}{50} = 58.7$$

$\therefore$ mean weight = 58.7kg

Here, N = 50 which is even.

$$\therefore \text{median} = \frac{1}{2}\left[\left[\left(\frac{n}{2}\right)\right]\text{th term} + \left(\frac{n}{2}+1\right)\text{th term}\right]$$

$$= \frac{1}{2}\left[(25\text{th term} + 26\text{th term})\right] [\because n = 50]$$

$$= \frac{1}{2}(57+62)$$

$$= \left(\frac{1}{2}x119\right) = 59.5$$

$\therefore$ median weight = 59.5kg

We know that,

mode = 3 (median) – 2(mean)

=(3x59.5)-2(58.7)

=178.5-117.4=61.1

mode weight =61.1 kg

Thus we have,

mean = 58.7 kg, median = 59.5 kg

and mode = 61.1 kg

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