



Exercise 14H

Question 10:

We may prepare the table, given below:

Marks (x)	No of students (f)	Cumulative Frequency	$f \times x$
4	8	8	32
12	10	18	120
20	16	34	320
28	24	58	672
36	15	73	540
44	7	80	308
	$\Sigma f = N = 80$		$\Sigma f \times x = 1992$

Here, $n = 80$, which is even.

$$\begin{aligned}
 \therefore \text{median} &= \frac{1}{2} \left[\left[\left(\frac{n}{2} \right) \right] \text{th term} + \left(\frac{n}{2} + 1 \right) \text{th term} \right] \\
 &= \frac{1}{2} [(40\text{th term} + 41\text{st term})] [\because n = 80] \\
 &= \frac{1}{2} (28 + 28) \\
 &= \left(\frac{1}{2} \times 56 \right) = 28
 \end{aligned}$$

Now, $\Sigma f \times x = 1992$ and $\Sigma f = 80$

$$\therefore \text{mean} = \frac{\Sigma f \times x}{\Sigma f} = \frac{1992}{80} = 24.9$$

$$\begin{aligned}
 \therefore \text{mode} &= 3(\text{median}) - 2(\text{mean}) \\
 &= (3 \times 28) - (2 \times 24.9) \\
 &= 84 - 49.8 = 34.2
 \end{aligned}$$

$$\therefore \text{modal marks} = 34.2$$

Question 11:

We may prepare the table, given below:

Age (in years) (x)	No. of persons (f)	Cumulative Frequency	f × x
19	13	13	247
21	15	28	315
23	16	44	368
25	18	62	450
27	16	78	432
29	15	93	435
31	13	106	403
	$\Sigma f = N = 106$		$\Sigma f \times x = 2650$

Here, $\Sigma f \times x = 2650$, and $\Sigma f = 106$

$$\text{mean} = \frac{\Sigma f \times x}{\Sigma f} = \frac{2650}{106} = 25$$

$\therefore \text{mean} = 25$

Here, $N = 106$ which is even

$$\begin{aligned} \therefore \text{median} &= \frac{1}{2} \left[\left(\frac{n}{2} \right) \text{th term} + \left(\frac{n}{2} + 1 \right) \text{th term} \right] \\ &= \frac{1}{2} [(53\text{th term} + 54\text{th term})] [\because n = 106] \\ &= \frac{1}{2} (25 + 25) \\ &= \left(\frac{1}{2} \times 50 \right) = 25 \end{aligned}$$

$\therefore \text{median} = 25$

$$\begin{aligned} \therefore \text{mode} &= 3(\text{median}) - 2(\text{mean}) \\ &= (3 \times 25) - (2 \times 25) \\ &= 75 - 50 = 25 \end{aligned}$$

Thus, mean = 25, median = 25 and mode = 25

***** END *****