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Ex 15.2 Class 11 Maths Question 7.

Classes	Frequencies
0 – 30	2
30 – 60	3
60 – 90	5
90 – 120	10
120 – 150	3
150 – 180	5
180 – 210	2

Solution:

Classes	Mid values x_i	f_i	$u_i = \frac{x_i - 105}{30}$	$f_i u_i$	$f_i u_i^2$
0 – 30	15	2	–3	–6	18
30 – 60	45	3	–2	–6	12
60 – 90	75	5	–1	–5	5
90 – 120	105	10	0	0	0
120 – 150	135	3	1	3	3
150 – 180	165	5	2	10	20
180 – 210	195	2	3	6	18
		30		2	76

Let assumed mean $(A) = 105$

$$\text{Mean } (\bar{x}) = A + \frac{\Sigma f_i u_i}{N} \times h = 105 + \frac{2}{30} \times 30 = 107$$

$$\text{Variance } (\sigma^2) = \frac{h^2}{N^2}[N\Sigma f_i u_i^2 - (\Sigma f_i u_i)^2]$$

$$= \frac{900}{900}[30 \times 76 - 4] = [2280 - 4] = 2276$$

Ex 15.2 Class 11 Maths Question 8.

Classes	Frequencies
0 – 10	5
10 – 20	8
20 – 30	15
30 – 40	16
40 – 50	6

Solution:

Classes	Mid values x_i	f_i	$u_i = \frac{x_i - 25}{10}$	$f_i u_i$	$f_i u_i^2$
0 – 10	5	5	–2	–10	20
10 – 20	15	8	–1	–8	8
20 – 30	25	15	0	0	0
30 – 40	35	16	1	16	16
40 – 50	45	6	2	12	24
		50		10	68

Let assumed mean $(A) = 25$

$$\text{Mean } (\bar{x}) = A + \frac{\Sigma f_i u_i}{N} \times h = 25 + \frac{10}{50} \times 10$$

$$= 25 + 2 = 27$$

$$\text{Variance}(\sigma^2) = \frac{h^2}{N^2}[N\Sigma f_i u_i^2 - (\Sigma f_i u_i)^2]$$

$$= \frac{(10)^2}{(50)^2}[50 \times 68 - (10)^2] = \frac{100}{2500}[3400 - 100]$$

$$= \frac{1}{25} \times 3300 = 132$$