

\* Short cut method of Arithmetic mean calculation

X	dx (X-5000)
4000	-1000
4500	-500
5000	0
6500	1500
7000	2000

$$\Sigma dx = 2000$$

$$\text{Let } a = 5000$$

$$\Sigma dx = 2000$$

$$N = 5$$

$$\therefore \bar{X} = a + \frac{\Sigma dx}{N}$$

$$= 5000 + \frac{2000}{5}$$

$$= 5000 + 400$$

$$\bar{X} = 5400 \text{ Ans.}$$

ii) Discrete Series. calculation of Arithmetic mean.

We calculate Arithmetic in discrete series when the data size large and classified in different group.

if Variable  $X = x_1, x_2, x_3, \dots, x_n$   
 frequency  $f = f_1, f_2, f_3, \dots, f_n$

$$\therefore \bar{X} = \frac{f_1 x_1 + f_2 x_2 + f_3 x_3 + \dots + f_n x_n}{f_1 + f_2 + f_3 + \dots + f_n}$$

$$= \frac{\Sigma fx}{\Sigma f}$$

Ex. calculate mean from the following series with direct method.

Size (x): 5    4    3    6    9    7    2

frequency (f): 5    6    4    10    8    3    9

Solution →

X	f	fx
5	5	25
4	6	24
3	4	12
6	10	60
9	8	72
7	3	21
2	9	18
$\Sigma f = 45$		$\Sigma fx = 232$

$$\begin{aligned} \therefore \bar{x} &= \frac{\Sigma fx}{\Sigma f} \\ &= \frac{232}{45} \\ &= 5.15 \end{aligned}$$

\* Short-cut method of calculating arithmetic mean in discrete series.

$$\bar{x} = a + \frac{\Sigma f dx}{\Sigma f}$$

Where  $a =$  assumed mean (5)

Ex-

X	f	dx	f dx
5	5	0	0
4	6	-1	-6
3	4	-2	-8
6	10	1	10
9	8	4	32
7	3	2	6
2	9	-3	-27
$\Sigma f = 45$		$\Sigma f dx = 7$	

$$\begin{aligned} \therefore \bar{x} &= a + \frac{\Sigma f dx}{\Sigma f} \\ &= 5 + \frac{7}{45} \\ &= 5 + 0.15 \\ \bar{x} &= 5.15 \end{aligned}$$