Exercise 9A

1. **Sol:**

Mean of given observations = $\frac{\text{sum of given observations}}{\text{total number of observations}}$

$\therefore\ 11 = \frac{x + (x+2)+(x+4)+(x+6)+(x+8)}{5}$

$\Rightarrow 55 = 5x + 20$

$\Rightarrow 5x = 55 - 20$

$\Rightarrow 5x = 35$

$\Rightarrow x = \frac{35}{5}$

$\Rightarrow x = 7$

Hence, the value of x is 7.

2.

Sol:

Mean of given observations = $\frac{\text{sum of given observations}}{\text{total number of observations}}$

Mean of 25 observations = 27

$\therefore$ Sum of 25 observations = $27 \times 25 = 675$

If 7 is subtracted from every number, then the sum $= 675 - (25 \times 7)$

$= 675 - 175$

$= 500$

Then, new mean = $\frac{500}{25} = 20$

Thus, the new mean will be 20.

3.

Sol:

The given data is shown as follows:

Class	Frequency (f_i)	Class mark (x_i)	$f_i x_i$
1 – 3	12	2	24
3 – 5	22	4	88
5 – 7	27	6	162
7 – 9	19	8	152
Total	$\Sigma f_i = 80$		$\Sigma f_i x_i = 426$

The mean of given data is given by

$$\overline{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$$

$= \frac{426}{80}$

$= 5.325$

Thus, the mean of the following data is 5.325.

4.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	$f_i \times x_i$
0 – 10	7	5	35
10 – 20	5	15	75
20 – 30	6	25	150
30 – 40	12	35	420
40 – 50	8	45	360
50 – 60	2	55	110
	$\Sigma f_i = 40$		$\sum(f_i \times x_i) = 1150$

$\therefore$ Mean, $\overline{x} = \frac{\sum(f_i \times x_i)}{\sum f_i}$

$= \frac{1150}{40}$

$= 28.75$

$\therefore \overline{x} = 28.75$

5.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	($f_i \times x_i$)
25 – 35	6	30	180
35 – 45	10	40	400
45 – 55	8	50	400
55 – 65	12	60	720
65 – 75	4	70	280
	$\Sigma f_i = 40$		$\sum(f_i \times x_i) = 1980$

$\therefore$ Mean, $\overline{x} = \frac{\sum (f_i \times x_i)}{\sum f_i}$

$= \frac{1980}{40}$

$= 49.5$

$\therefore \overline{x} = 49.5$

6.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	($f_i \times x_i$)
0 - 100	6	50	300
100 – 200	9	150	1350
200 – 300	15	250	3750
300 – 400	12	350	4200
400 – 500	8	450	3600
	$\Sigma f_i = 50$		$\sum (f_i \times x_i) = 13200$

$\therefore$ Mean, $\overline{x} = \frac{\sum (f_i \times x_i)}{\sum f_i}$

$= \frac{13200}{50}$

$= 264$

$\therefore \overline{x} = 264$

7.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	($f_i x_i$)
84 – 90	8	87	696
90 – 96	10	93	930
96 – 102	16	99	1584
102 – 108	23	105	2415
108 – 114	12	111	1332
114 – 120	11	117	1287
Total	$\Sigma f_i = 80$		$\Sigma f_i x_i = 8244$

The mean of the data is given by,

$$\bar{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$$

$= \frac{8244}{80}$

$= 103.05$

Thus, the mean of the following data is 103.05.

8.

Sol:

The given data is shown as follows:

Class	Frequency (f_i)	Mid values (x_i)	(f_i x_i)
0 – 10	3	5	15
10 – 20	4	15	60
20 – 30	p	25	25p
30 – 40	3	35	105
40 – 50	2	45	90
Total	$\Sigma f_i = 12 + p$		$\Sigma f_i x_i = 270 + 25p$

The mean of the given data is given by,

$$\bar{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$$

$\Rightarrow 24 = \frac{270+25p}{12+p}$

$\Rightarrow 24(12 + p) = 270 + 25p$

$\Rightarrow 288 + 24p = 270 + 25p$

$\Rightarrow 25p - 24p = 288 - 270$

$\Rightarrow p = 18$

Hence, the value of p is 18.

9.

Sol:

The given data is shown as follows:

Daily pocket allowance (in ₹)	Number of children (f_i)	Class mark (x_i)	$f_i x_i$
11 – 13	7	12	84
13 – 15	6	14	84
15 – 17	9	16	144
17 – 19	13	18	234
19 – 21	f	20	20f
21 – 23	5	22	110
23 – 25	4	24	96
Total	$\Sigma f_i = 44 + f$		$\Sigma f_i x_i = 752 + 20f$

The mean of the given data is given by,

$$\bar{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$$

$$\Rightarrow 18 = \frac{750+20f}{44+f}$$

$\Rightarrow$ 18 (44 + f) = 752 + 20f

$\Rightarrow$ 792 + 18f = 752 + 20f

$\Rightarrow$ 20f – 18f = 792 – 752

$\Rightarrow$ 2f = 40

$\Rightarrow$ f = 20

Hence, the value of f is 20.

10.

Sol:

The given data is shown as follows:

Class	Frequency (f_i)	Class mark (x_i)	$f_i x_i$
0 – 20	7	10	70
20 – 40	p	30	30p
40 – 60	10	50	500
60 – 80	9	70	630
80 – 100	13	90	1170
Total	$\Sigma f_i = 39 + p$		$\Sigma f_i x_i = 2370 + 30p$

The mean of the given data is given by,

$$\bar{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$$

$\Rightarrow 54 = \frac{2370+30p}{39+p}$

$\Rightarrow 54\,(39 + p) = 2370 + 30p$

$\Rightarrow 2106 + 54p = 2370 – 2106$

$\Rightarrow 24p = 264$

$\Rightarrow p = 11$

Hence, the value of p is 11.

11.

Sol:

The given data is shown as follows:

Class interval	Frequency (f_i)	Class mark (x_i)	$f_i x_i$
0 – 10	7	5	35
10 – 20	10	15	150
20 – 30	x	25	25x
30 – 40	13	35	455
40 – 50	y	45	45y
50 – 60	10	55	550
60 – 70	14	65	910
70 – 80	9	75	675
Total	$\Sigma f_i = 63 + x + y$		$\Sigma f_i x_i = 2775 + 25x + 45y$

Sum of the frequencies = 100

$\Rightarrow \sum_i f_i = 100$

$\Rightarrow 63 + x + y = 100$

$\Rightarrow x + y = 100 – 63$

$\Rightarrow x + y = 37$

$\Rightarrow y = 37 – x$ ……..(1)

Now, the mean of the given data is given by,

$$\bar{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$$

$\Rightarrow 42 = \frac{2775+25x+45y}{100}$

$\Rightarrow$ 4200 = 2775 + 25x + 45y

$\Rightarrow$ 4200 – 2775 = 25x + 45y

$\Rightarrow$ 1425 = 25x + 45(37 – x) [from (1)]

$\Rightarrow$ 1425 = 25x + 1665 – 45x

$\Rightarrow$ 20x = 1665 – 1425

$\Rightarrow$ 20x = 240

$\Rightarrow$ x = 12

If x = 12, then y = 37 – 12 = 25

Thus, the value of x is 12 and y is 25.

12.

Sol:

The given data is shown as follows:

Expenditure (in ₹)	Number of families (f_i)	Class mark (x_i)	$f_i x_i$
140 – 160	5	150	750
160 – 180	25	170	4250
180 – 200	f_1	190	$190f_1$
200 – 220	f_2	210	$210f_2$
220 – 240	5	230	1150
Total	$\Sigma f_i = 35 + f_1 + f_2$		$\Sigma f_i x_i = 6150 + 190f_1 + 210f_2$

Sum of the frequencies = 100

$\Rightarrow \sum_i f_i = 100$

$\Rightarrow 35 + f_1 + f_2 = 100$

$\Rightarrow f_1 + f_2 = 100 - 35$

$\Rightarrow f_1 + f_2 = 65$

$\Rightarrow f_2 = 65 - f_1$ ……..(1)

Now, the mean of the given data is given by,

$$\bar{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$$

$\Rightarrow 188 = \frac{6150+190f_1+210f_2}{100}$

$\Rightarrow 18800 = 6150 + 190f_1 + 210f_2$

$\Rightarrow 18800 - 6150 = 190f_1 + 210f_2$

$\Rightarrow 12650 = 190f_1 + 210(65 - f_1)$ [from (1)]

$\Rightarrow 12650 = 190f_1 - 210f_1 + 13650$

$\Rightarrow 20f_1 = 13650 - 12650$

$\Rightarrow 20f_1 = 1000$

$\Rightarrow f_1 = 50$

If $f_1 = 50$, then $f_2 = 65 - 50 = 15$

Thus, the value of f_1 is 50 and f_2 is 15.

13.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	($f_i \times x_i$)
0 – 20	7	10	70
20 – 40	f_1	30	$30f_1$
40 – 60	12	50	600
60 – 80	$18 - f_1$	70	$1260 - 70f_1$
80 – 100	8	90	720
100 – 120	5	110	550
Total	$\Sigma f_i = 50$		$\Sigma (f_i \times x_i) = 3200 - 40f_1$

We have:

$7 + f_1 + 12 + f_2 + 8 + 5 = 50$

$\Rightarrow f_1 + f_2 = 18$

$\Rightarrow f_2 = 18 - f_1$

$\therefore$ Mean, $\bar{x} = \frac{\Sigma_i (f_i \times x_i)}{\Sigma_i f_i}$

$\Rightarrow 57.6 = \frac{3200 - 40f_1}{50}$

$\Rightarrow 40f_1 = 320$

$\therefore f_1 = 8$

And $f_2 = 18 - 8$

$\Rightarrow f_2 = 10$

$\therefore$ The missing frequencies are $f_1 = 8$ and $f_2 = 10$.

14.

Sol:

Using Direct method, the given data is shown as follows:

Number of heartbeats per minute	Number of patients (f_i)	Class mark (x_i)	$f_i x_i$
65 – 68	2	66.5	133
68 – 71	4	69.5	278
71 – 74	3	72.5	217.5
74 – 77	8	75.5	604
77 – 80	7	78.5	549.5
80 – 83	4	81.5	326
83 – 86	2	84.5	169
Total	$\Sigma f_i = 30$		$\Sigma f_i x_i = 2277$

The mean of the data is given by,

$$\overline{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$$

$$= \frac{2277}{30}$$

$$= 75.9$$

Thus, the mean heartbeats per minute for these patients is 75.9.

15.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	Deviation (d_i) $d_i = (x_i – 25)$	($f_i \times d_i$)
0 – 10	12	5	-20	-240
10 – 20	18	15	-10	-180
20 – 30	27	25 = A	0	0
30 – 40	20	35	10	200
40 – 50	17	45	20	340
50 – 60	6	55	30	180
Total	$\Sigma f_i = 100$			$\Sigma (f_i \times d_i) = 300$

Let A = 25 be the assumed mean. Then we have:

Mean, $\overline{x} = A + \frac{\sum (f_i \times d_i)}{\sum f_i}$

$= 25 + \frac{300}{100}$

$= 28$

$\therefore \overline{x} = 28$

16.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	Deviation (d_i) $d_i = (x_i – 150)$	($f_i \times d_i$)
100 – 120	10	110	-40	-400
120 – 140	20	130	-20	-400
140 – 160	30	150 = A	0	0
160 – 180	15	170	20	300
180 – 200	5	190	40	200
	$\Sigma f_i = 80$			$\Sigma (f_i \times d_i) = -300$

Let A = 150 be the assumed mean. Then we have:

Mean, $\overline{x} = A + \frac{\sum (f_i \times d_i)}{\sum f_i}$

$= 150 – \frac{300}{80}$

$= 150 – 3.75$

$\therefore \overline{x} = 146.25$

17.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	Deviation (d_i) $d_i = (x_i - 50)$	($f_i \times d_i$)
0 –20	20	10	-40	-800
20 – 40	35	30	-20	-700
40 –60	52	50 = A	0	0
60 – 80	44	70	20	880
80 – 100	38	90	40	1520
100 – 120	31	110	60	1860
	$\Sigma f_i = 220$			$\Sigma (f_i \times d_i) = 2760$

Let A = 50 be the assumed mean. Then we have:

Mean, $\overline{x} = A + \frac{\sum(f_i \times d_i)}{\sum f_i}$

$= 50 + \frac{2760}{220}$

$= 50 + 12.55$

$\therefore \overline{x} = 62.55$

18.

Sol:

Using Direct method, the given data is shown as follows:

Literacy rate (%)	Number of cities (f_i)	Class mark (x_i)	($f_i x_i$)
45 – 55	4	50	200
55 – 65	11	60	660
65 – 75	12	70	840
75 – 85	9	80	720
85 – 95	4	90	360
Total	$\Sigma f_i = 40$		$\Sigma f_i x_i = 2780$

The mean of the data is given by,

$\overline{x} = \frac{\sum_i f_i x_i}{\sum_i f_i}$ s

$= \frac{2780}{40}$

$= 69.5$

Thus, the mean literacy rate is 69.5%.

19.

Sol:

Let us choose a = 25, h = 10, then $d_i = x_i - 25$ and $u_i = \frac{x_i - 25}{10}$

Using step-deviation method, the given data is shown as follows:

Class	Frequency (f_i)	Class mark (x_i)	$d_i = x_i - 25$	$u_i = \frac{x_i-25}{10}$	($f_i u_i$)
0 – 10	7	5	-20	-2	-14
10 – 20	10	15	-10	-1	-10
20 – 30	15	25	0	0	0
30 – 40	8	35	10	1	8
40 – 50	10	45	20	2	20
Total	$\Sigma f_i = 50$				$\Sigma f_i u_i = 4$

The mean of the data is given by,

$\overline{x} = a + \left(\frac{\Sigma_i f_i u_i}{\Sigma_i f_i}\right) \times h$

$= 25 + \frac{4}{50} \times 10$

$= 25 + \frac{4}{5}$

$= \frac{125 + 4}{5}$

$= \frac{129}{5}$

$= 25.8$

Thus, the mean is 25.8.

20.

Sol:

Let us choose a = 40, h = 10, then $d_i = x_i - 40$ and $u_i = \frac{x_i - 40}{10}$

Using step-deviation method, the given data is shown as follows:

Class	Frequency (f_i)	Class mark (x_i)	$d_i = x_i - 40$	$u_i = \frac{x_i-40}{10}$	($f_i u_i$)
5 – 15	6	10	-30	-3	-18
15 – 25	10	20	-20	-2	-20
25 – 35	16	30	-10	-1	-16

35 – 45	15	40	0	0	0
45 – 55	24	50	10	1	24
55 – 65	8	60	20	2	16
65 – 75	7	70	30	3	21
Total	$\Sigma f_i = 86$				$\Sigma f_i u_i = 7$

The mean of the data is given by,

$$\bar{x} = a + \left(\frac{\sum_i f_i u_i}{\sum_i f_i} \right) \times h$$

$= 40 + \frac{7}{86} \times 10$

$= 40 + \frac{70}{86}$

$= 40 + 0.81$

$= 40.81$

21.

Sol:

Let us choose a = 202.5, h = 1, then $d_i = x_i - 202.5$ and $u_i = \frac{x_i - 202.5}{1}$

Using step-deviation method, the given data is shown as follows:

Weight	Number of packets (f_i)	Class mark (x_i)	$d_i = x_i - 202.5$	$u_i = \frac{x_i - 202.5}{1}$	($f_i u_i$)
200 - 201	13	200.5	-2	-2	-26
201 – 202	27	201.5	-1	-1	-27
202 – 203	18	202.5	0	0	0
203 – 204	10	203.5	1	1	10
204 – 205	1	204.5	2	2	2
205 – 206	1	205.5	3	3	3
Total	$\Sigma f_i = 70$				$\Sigma f_i u_i = -38$

The mean of the given data is given by,

$$\bar{x} = a + \left(\frac{\sum_i f_i u_i}{\sum_i f_i} \right) \times h$$

$= 202.5 + \left(\frac{-38}{70}\right) \times 1$

$= 202.5 - 0.542$

$= 201.96$

Hence, the mean is 201.96 g.

22.

Sol:

Let us choose a = 45, h = 10, then $d_i = x_i - 45$ and $u_i = \frac{x_i - 45}{10}$

Using step-deviation method, the given data is shown as follows:

Weight	Number of packets (f_i)	Class mark (x_i)	$d_i = x_i - 45$	$u_i = \frac{x_i-45}{10}$	($f_i u_i$)
20 – 30	25	35	-20	-2	-50
30 – 40	40	35	-10	-1	-40
40 – 50	42	45	0	0	0
50 – 60	33	55	10	1	33
60 – 70	10	65	20	2	20
Total	$\Sigma f_i = 150$				$\Sigma f_i u_i = -37$

The mean of the given data is given by,

$$\overline{x}\ a+\left(\frac{\sum_i f_i u_i}{\sum_i f_i}\right)\times h$$

$= 45 - \left(\frac{37}{150}\right) \times 10$

$= 45 - \frac{37}{15}$

$= 45 - 2.466$

$= 42.534$

Hence, the mean is 42.534.

23.

Find the mean marks.

Sol:

Let us choose a = 52.5, h = 15, then $d_i = x_i - 52.5$ and $u_i = \frac{x_i - 52.5}{15}$

Using step-deviation method, the given data is shown as follows:

Weight	Number of students (f_i)	Class mark (x_i)	$d_i = x_i - 37.5$	$u_i = \frac{x_i-52.5}{15}$	($f_i u_i$)
0 – 15	2	7.5	-45	-3	-6
15 – 30	4	22.5	-30	-2	-8
30 – 45	5	37.5	-15	-1	-5

45 – 60	20	52.5	0	0	0
60 – 75	9	67.5	15	1	9
75 – 90	10	82.5	30	2	20
Total	$\Sigma f_i = 50$				$\Sigma f_i u_i = 10$

The mean of the given data is given by,

$$\overline{x} = a + \left(\frac{\sum_i f_i u_i}{\sum_i f_i} \right) \times h$$

$$= 52.5 + \left(\frac{10}{50}\right) \times 15$$

$$= 52.5 + 3$$

$$= 55.5$$

Thus, the mean is 55.5.

24.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	$u_i = \frac{(x_i - A)}{h} = \frac{(x_i - 33)}{6}$	($f_i \times u_i$)
18 – 24	6	21	-2	-12
24 – 30	8	27	-1	-8
30 – 36	12	33 = A	0	0
36 – 42	8	39	1	8
42 – 48	4	45	2	8
48 – 54	2	51	3	6
Total	$\Sigma f_i = 40$			$\Sigma (f_i \times u_i) = 2$

Now, A = 33, h = 6, $\Sigma f_i = 40$ and $\Sigma (f_i \times u_i) = 2$

$$\therefore \text{ Mean, } \overline{x} = A + \left\{ h \times \frac{\sum (f_i \times u_i)}{\sum f_i} \right\}$$

$$= 33 + \left\{6 \times \frac{2}{40}\right\}$$

$$= 33 + 0.3$$

$$= 33.3$$

$\therefore \overline{x} = 33.3$ years

25.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	$u_i = \frac{(x_i - A)}{h} = \frac{(x_i - 550)}{20}$	($f_i \times u_i$)
500 – 520	14	510	-2	-28
520 – 540	9	530	-1	-9
540 – 560	5	550 = A	0	0
560 – 580	4	570	1	4
580 – 600	3	590	2	6
600 – 620	5	610	3	15
	$\Sigma f_i = 40$			$\Sigma (f_i \times u_i) = -12$

Now, A = 550, h = 20, $\Sigma f_i = 40$ and $\Sigma (f_i \times u_i) = -12$

$\therefore$ Mean, $\overline{x} = A + \left\{h \times \frac{\sum (f_i \times u_i)}{\sum f_i}\right\}$

$= 550 + \left\{20 \times \frac{(-12)}{40}\right\}$

$= 550 - 6$

$= 544$

$\therefore \overline{x} = 544$

26.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	$u_i = \frac{(x_i - A)}{h} = \frac{(x_i - 42)}{5}$	($f_i \times u_i$)
24.5 – 29.5	4	27	-3	-12
29.5 – 34.5	14	32	-2	-28
34.5 – 39.5	22	37	-1	-22
39.5 – 44.5	16	42 = A	0	0
44.5 – 49.5	6	47	1	6
49.5 – 54.5	5	52	2	10
54.5 – 59.5	3	57	3	9
	$\Sigma f_i = 70$			$\Sigma (f_i \times u_i) = -37$

Now, A = 42, h = 5, $\Sigma f_i = 70$ and $\Sigma (f_i \times u_i) = -37$

$\therefore$ Mean, $\overline{x} = A + \left\{h \times \frac{\sum(f_i \times u_i)}{\sum f_i}\right\}$

$= 42 + \left\{5 \times \frac{(-37)}{70}\right\}$

$= 42 - 2.64$

$= 39.36$

$\therefore \overline{x} = 39.36$

$\therefore$ Mean age = 39.36 years.

27.

Sol:

Class	Frequency (f_i)	Mid values (x_i)	$u_i = \frac{(x_i - A)}{h} = \frac{(x_i - 29.5)}{10}$	($f_i \times u_i$)
4.5 – 14.5	6	9.5	-2	-12
14.5 – 24.5	11	19.5	-1	-11
24.5 – 34.5	21	29.5 = A	0	0
34.5 – 44.5	23	39.5	1	23
44.5 – 54.5	14	49.5	2	28
54.5 – 64.5	5	59.5	3	15
	$\Sigma f_i = 80$			$\Sigma (f_i \times u_i) = 43$

Now, A = 29.5, h = 10, $\Sigma f_i = 80$ and $\Sigma (f_i \times u_i) = 43$

$\therefore$ Mean, $\overline{x} = A + \left\{h \times \frac{\sum(f_i \times u_i)}{\sum f_i}\right\}$

$= 29.5 + \left\{10 \times \frac{43}{80}\right\}$

$= 29.5 + 5.375$

$= 34.875$

$\therefore \overline{x} = 34.875$

$\therefore$ The average age of the patients is 34.87 years.

28.

Sol:

Let us choose a = 92, h = 5, then $d_i = x_i - 92$ and $u_i = \frac{x_i - 92}{5}$

Using step-deviation method, the given data is shown as follows:

Weight (in grams)	Number of eggs (f_i)	Class mark (x_i)	$d_i = x_i - 92$	$u_i = \frac{x_i - 92}{5}$	($f_i u_i$)
74.5 – 79.5	4	77	-15	-3	-12
79.5 – 84.5	9	82	-10	-2	-18
84.5 – 89.5	13	87	-5	-1	-13
89.5 – 94.5	17	92	0	0	0
94.5 – 99.5	12	97	5	1	12
99.5 – 104.5	3	102	10	2	6
104.5 – 109.5	2	107	15	3	6
Total	$\Sigma f_i = 60$				$\Sigma f_i u_i = -19$

The mean of the given data is given by,

$$\bar{x} = a + \left(\frac{\sum_i f_i u_i}{\sum_i f_i} \right) \times h$$

$= 92 + \left(\frac{-19}{60}\right) \times 5$

$= 92 - 1.58$

$= 90.42$

≈ 90

Thus, the mean weight to the nearest gram is 90 g.

29.

Sol:

Let us choose a = 17.5, h = 5, then $d_i = x_i - 17.5$ and $u_i = \frac{x_i - 17.5}{5}$

Using step-deviation method, the given data is shown as follows:

Marks	Number of students (cf)	Frequency (f_i)	Class mark (x_i)	$d_i = x_i - 17.5$	$u_i = \frac{x_i - 17.5}{5}$	($f_i u_i$)
0 – 5	3	3	2.5	-15	-3	-9
5 – 10	10	7	7.5	-10	-2	-14
10 – 15	25	15	12.5	-5	-1	-15
15 – 20	49	24	17.5	0	0	0
20 – 25	65	16	22.5	5	1	16
25 – 30	73	8	27.5	10	2	16
30 – 35	78	5	32.5	15	3	15
35 – 40	80	2	37.5	20	4	8

Total		$\Sigma f_i = 80$				$\Sigma f_i u_i = 17$

The mean of the given data is given by,

$$\bar{x} = a + \left(\frac{\sum_i f_i u_i}{\sum_i f_i} \right) \times h$$

$= 17.5 + \left(\frac{17}{80}\right) \times 5$

$= 17.5 + 1.06$

$= 18.56$

Thus, the mean marks correct to 2 decimal places is 18.56.