chapter-23 Data Handling-II
Exercise-23.1

Solution-01:-

Ashish studies on three consecutive days are 4 hours, 5 hours, 3 hours.

he study daily on average $= \frac{4\text{hours} + 5\text{hours} + 3\text{hours}}{3}$

$= \frac{12\text{hours}}{3}$ $\left[\text{Mean} = \frac{\text{Sum of the observations}}{\text{No. of observations}}\right]$

$= 4\text{ hours}$.

∴ Ashish studies 4 hours daily on an average.

Solution-02:-

we have,

mean runs scored $= \frac{58+76+40+35+48+45+0+100}{8}$

$= 50.25\text{Runs}$.

Thus, the mean runs scored in an innings is 50.25 Runs

Solution-04:-

we have,

mean enrollment $= \frac{1555+1670+1750+2019+2540+2820}{6}$

$= 2059$.

Thus, mean enrollment of the school for this period 2059.

Solution-05 :-

(i) Range of Rainfall $= 20.5 - 0$

$= 20.5$.

(ii) mean Rainfall $= \frac{0+12.2+2.1+0.0+20.5+5.3+1.0}{7}$

$= 5.87\text{mm}$.

(iii) 5 days was the rainfall less than mean rainfall

Solution-06:-

The heights of 5 persons are 140cm, 150cm, 152cm, 158cm and 161cm.

$$\text{mean height} = \frac{140\text{cm}+150\text{cm}+152\text{cm}+158\text{cm}+161\text{cm}}{5}$$

$$= 152.2\text{cm}.$$

Solution-07:-

we have,

$$\text{mean} = \frac{994+996+998+1002+1000}{5}$$

$$= 998.$$

Thus, mean is 998.

Solution-08:-

First five natural numbers are 1, 2, 3, 4, 5.

Let $\bar{x}$ denote their arithematic mean.

Then, $\bar{x} = \frac{1+2+3+4+5}{5} = \frac{15}{5} = 3.$

Thus, Mean = 3.

Solution-09:-

The All factors of 10 are 1, 2, 5 and 10.

Let $\bar{x}$ be the arithematic mean.

Then $\bar{x} = \frac{1+2+5+10}{4} = \frac{18}{4} = 4.5.$

Solution-10:-

first 10 even natural numbers are 2, 4, 6, 8, 10, 12, 14, 16, 18, 20.

$$\text{mean} = \frac{2+4+6+8+10+12+14+16+18+20}{10} = \frac{110}{10} = 11.$$

$\therefore$ Mean $= \bar{x} = 11.$

Solution-11:-

we have,

$$\text{mean} = \frac{x+x+2+x+4+x+6+x+8}{5}$$

$$= \frac{5x+20}{5}$$

$$= \frac{5(x+4)}{5}$$

$$= x+4.$$

Thus, Mean is $x+4$.

Solution -12 :-

first five multiples of '3' are 3, 6, 9, 12, 15.

Let $\bar{x}$ be the Mean.

$$\bar{x} = \frac{3+6+9+12+15}{5}$$

$$\bar{x} = \frac{45}{5}$$

$$\bar{x} = 9.$$

Thus, Mean is '9'

Solution -13 :-

we have,

$$\text{Mean}(\bar{x}) = \frac{3.4+3.6+4.2+4.5+3.9+4.1+3.8+4.5+4.4136}{10}$$

$$= \frac{40}{10}\,kg = 4kg.$$

Solution -14 :-

we have,

$$\text{Mean}(\bar{x}) = \frac{64+36+47+23+0+19+81+93+72+35+37+1}{12}$$

$$= 39.5.$$

Thus, Mean is 39.5.

Solution -15 :-

We have,

$$\text{Mean Number of Children Per family} = \frac{2+4+3+5+4+2+3+1+1+5}{10}$$

$$= \frac{30}{10}$$

$$= 3.$$

$\therefore$ '3' children Per family

Solution-16:-

We have,

n = Number of observations = 100

Mean = 40.

$\therefore$ Mean = $\frac{\text{Sum of the observations}}{\text{Number of observations}}$

$\Rightarrow$ Mean × No of observations = Sum of observations

$\Rightarrow$ 100 × 40 = Sum of observations

Thus, incorrect sum of observations = 100 × 40.

= 4,000.

Correct sum of the observations = Incorrect sum of the observations - Incorrect observation + Correct observation.

$\Rightarrow$ correct sum of the observations = 4000 - 83 + 53

= 3,970.

$\therefore$ correct mean = $\frac{\text{correct sum of the observations}}{\text{Number of observations}}$

= $\frac{3970}{100}$

= 39.7.

$\therefore$ correct mean is 39.7.

Solution-17:-

We have.

n = Number of observations = 5, Mean = 27.

Mean = $\frac{\text{Sum of the observations}}{\text{Number of observations}}$

$n = 5, \bar{x} = 27.$

27 × 5 = Sum of the observations

135 = sum of the observations.

When one number excluded

$n = 4, \bar{x} = 25.$

$\bar{x} = \frac{\text{Sum of the observations}}{n}$ $\Rightarrow$ Sum = 25 × 4 = 100.

$\therefore$ excluded number = Sum mean of 5 numbers - Sum mean of 4 numbers

= 135 - 100 = 35.

Solution-18:-

It is given that,

Number of students = 7.

Mean ($\bar{x}$) = 55 kg.

The given numbers are 52, 54, 55, 53, 56 & 54.

Let the seventh weight be 'k' then.

Mean = $\frac{52+54+55+53+56+54+k}{7}$

$\Rightarrow$ 55 × 7 = 324 + k

$\Rightarrow$ k = 385 - 324

$\Rightarrow$ k = 61 kg.

Seventh weight be 61 kg.

Solution-19:-

we have, Number of observations = 8

Mean = 15kg

we know that, Mean = $\frac{\text{Sum of the observations}}{\text{No of observations}}$

$\Rightarrow$ 15kg (8) = Sum of the observations

$\Rightarrow$ Sum of the observations = 120kg.

If each number is multiplied by '2'

Then. sum of the observations = 2(120kg)
= 240kg.

New Mean = $\frac{\text{Sum of observations}}{\text{No of observations}} = \frac{240\text{kg}}{8}$

$\therefore$ Mean ($\bar{x}$) = 30kg

Solution-20:-

we have,

number of observations = 5; Mean ($\bar{x}$) = 18.

we know that.

Mean = $\frac{\text{Sum of observations}}{\text{No of observations}}$

$18 = \frac{\text{Sum of observations}}{5}$

$\Rightarrow$ Sum of observations = 90.

If one number is excluded.

Mean ($\bar{x}$) = 16, number of observations = 4.

$16 = \frac{\text{Sum of observations}}{4}$

$\Rightarrow$ Sum of observations = 64.

$\therefore$ excluded number = Sum of five numbers - Sum of four numbers

= 90 - 64

= 26.

$\therefore$ excluded number is '26'.

Solution-21 :-

number of observations = 200.

Mean = 50.

$\therefore$ Mean = $\frac{\text{Sum of the observations}}{\text{number of observations}}$

$\Rightarrow$ Sum of observations = 50 × 200

= 10000

Thus, Incorrect sum of observations = 10000

Correct sum of the observations = Incorrect sum of the observations - Incorrect observations + correct observations.

= 10000 - (92 + 8) + 192 + 88

= 10000 - 100 + 280

$\Rightarrow$ 11180. 10180

$\therefore$ Mean = $\frac{\text{correct sum of the observations}}{\text{number of observations}}$

= $\frac{10,180}{200}$ = $\frac{10,180}{200}$.

= 50.9

$\therefore$ Mean $(\bar{x})$ = 50.9.

Solution-22 :-

we have,

Mean = 27, Number of observations = 5.

we know that,

Mean = $\frac{\text{Sum of observations}}{\text{Number of observations}}$

$\Rightarrow$ Number of observations × Mean = Sum of observations

$\Rightarrow$ Sum of observations = 27 × 5 = 135.

$\therefore$ sum of observations = 135.

$\therefore$ If one number is included

Mean = 25, Number of observations = 6

$\Rightarrow$ 25 = $\frac{\text{Sum of observations}}{6}$

$\Rightarrow$ 150 = Sum of observations

$\therefore$ Sum of Observations = 150.

Included number = Sum of observation of 6 numbers - Sum of observation of 5 numbers

= 150 - 135

= 15

$\therefore$ included number is '15'.

Solution -23:-

We have, Number of observation = 75.

mean = 35kg.

We know that, mean = $\frac{\text{sum of observations}}{\text{No of observations}}$

$\Rightarrow 75 \times 35 = \text{sum of observations}$

$\Rightarrow$ Sum of observations = 2625.

If each number is multiplied by '4'

Then sum of observations = 4(2625)

= 10500

$\therefore$ New mean = $\frac{\text{sum of observations}}{\text{No of observations}}$

$= \frac{10500}{75}$

$= 140.$

$\therefore$ New mean is '140'

chapter-23 Data Handling-II
Exercise-23.2

Exercise-23.2.

Solution-01 :-

Score(x_i)	Frequency(f_i)	$f_i x_i$
1	2	2
2	5	10
3	1	3
4	4	16
5	6	30
6	2	12
	$20 = N$	$73 = \Sigma f_i x_i$

We have,

$$\text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i}$$

$$= \frac{73}{20}$$

Mean Score $= 3.65$

Solution-02 :-

Wages(x_i)	No. of workers(f_i)	$f_i x_i$
130	2	260
150	4	600
180	6	1080
200	3	600
	15	2540

We have,

Mean Wage $= \frac{2540}{15} = ₹169.33$ $\left[\because \text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i}\right]$

Solution-03 :-

Weight(in kg)(x_i)	Number of Workers(f_i)	$f_i x_i$
60	4	240
63	5	315
66	3	198
72	1	72
75	2	150
	$15 = \Sigma f_i$	$975 = \Sigma f_i x_i$

We have, Mean weight $= \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{975}{15}$

$= 65\text{kg}$

$\therefore$ Mean weight $= 65\text{kg}$.

Solution-04:-

Age (in years)	Number of students (f_i)	$f_i x_i$
14	15	210
15	14	210
16	10	160
17	8	136
18	3	54
	50	770

$$\text{Mean Age} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{770}{50}$$

$$= 15.4 \text{ years}$$

Solution-05:-

x	f	fx
5	4	20
6	8	48
7	14	98
8	11	88
9	3	27
	40	281

$$\text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{281}{40}$$

$$= 7.025.$$

$\therefore$ Mean = 7.025.

Solution-06:-

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we have,

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Thus, Mean = 3.

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Then $\bar{x} = \frac{1+2+5+10}{4} = \frac{18}{4} = 4.5$.

Solution-10:-

x	f	fx
5	2	10
8	5	40
10	8	80
12	22	264
p	7	7p
20	4	80
25	2	50
	$\Sigma f_i = 50$	524+7p

It is Given that,

Mean = 12.58.

$\Sigma f_i = 50$

$\Sigma f_i x_i = 524 + 7p$

we Knowthat,

$\text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i}$.

$\Rightarrow 12.58 = \frac{524+7p}{50}$

$\Rightarrow 629 - 524 = 7p$

$\Rightarrow 7p = 105$

$\Rightarrow p = \frac{105}{7}$

$\Rightarrow \boxed{p = 15}$

Solution-12:-

x	f	fx.
15	2	30
19	3	51
19	4	76
20+p	5p	$100p+5p^2$
23	6	138
	15+5p	$295+100p+5p^2$

It is Given that,

Mean = 20,

$\Sigma f_i = 15 + 5p$

$\Sigma f_i x_i = 295 + 100p + 5p^2$

$\text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i}$

$\Rightarrow 20 = \frac{295+100p+5p^2}{15+5p}$

$\Rightarrow 100p + 300 = 295 + 100p + 5p^2$

$\Rightarrow 5p^2 + 100p - 100p = 300 - 295$

$\Rightarrow 5p^2 = 5$

$\Rightarrow p^2 = 1$

$\Rightarrow p = \pm 1$

$\Rightarrow p = 1$.