RD SHARMA

Solutions

Class 7 Maths

Chapter 23

Ex 23.2

Q1) *A die was thrown 20 times and the following scores were recorded:*

5, 2, 1, 3, 4, 4, 5, 6, 2, 2, 4, 5, 5, 6, 2, 2, 4, 5, 5, 1

Prepare the frequency table of the scores on the upper face of the die and find the mean score.

Solution:

The frequency table for the given data is as follows:

x:	1	2	3	4	5	6
f:	2	5	1	4	6	2

In order to compute the arithmetic mean, we prepare the following table:

Computation of Arithmetic Mean

Scores (x_i)	Frequency (f_i)	$x_i f_i$
1	2	2
2	5	10
3	1	3
4	4	16
5	6	30
6	2	12
Total	$\sum f_i = 20$	$\sum f_i x_i = 73$

We have, $\sum f_i = 20$ and $\sum f_i x_i = 73$

$\therefore$ Mean score $= \dfrac{\sum f_i x_i}{\sum f_i} = \dfrac{73}{20} = 3.65$.

Q2) *The daily wages (in Rs) of 15 workers in a factory are given below:*

200, 180, 150, 150, 130, 180, 180, 200, 150, 130, 180, 180, 200, 150, 180

Prepare the frequency table and find the mean wage.

Solution:

The frequency table for the given data is as follows:

Wages (x_i):	130	150	180	200
Number of workers (f_i):	2	4	6	3

In order to compute the mean wage, we prepare the following table:

Mean wages of the workers

x_i	f_i	$x_i f_i$
130	2	260
150	4	600
180	6	1080

200	3	600
Total	$\sum f_i = N = 15$	$\sum f_i x_i = 2540$

$\therefore$ Mean $= \dfrac{\sum f_i x_i}{\sum f_i} = \dfrac{2540}{15} = 169.33$.

Q3) The following table shows the weights (in kg) of 15 workers in a factory:

Weight (in kg):   60   63   66   72   75

Numbers of workers: 4   5   3   1   2

Calculate the mean weight.

Solution:

Calculation of Mean

x_i	f_i	$x_i f_i$
60	4	240
63	5	315
66	3	198
72	1	72
75	2	150
Total	$\sum f_i = 15$	$\sum f_i x_i = 975$

$\therefore$ Mean Weight $= \dfrac{\sum f_i x_i}{\sum f_i} = \dfrac{975}{15} = 65$ kg.

Q4) The ages (in years) of 50 students of a class in a school are given below:

Age (in years):   14   15   16   17   18

Numbers of students: 15   14   10   8   3

Find the mean age.

Solution:

Calculation of Mean

x_i	f_i	$x_i f_i$
14	15	210
15	14	210
16	10	160
17	8	136
18	3	54

Total	$\sum f_i = 50$	$\sum f_i x_i = 770$

$\therefore$ Mean Weight $= \dfrac{\sum f_i x_i}{\sum f_i} = \dfrac{770}{50} = 15.4$ yrs.

Q5) Calculate the mean for the following distribution:

x:	5	6	7	8	9
f:	4	8	14	11	3

Solution:

Calculation of Mean

x_i	f_i	$x_i f_i$
5	4	20
6	8	48
7	14	98
8	11	88
9	3	27
Total	$\sum f_i = 40$	$\sum f_i x_i = 281$

$\therefore$ Mean $= \dfrac{\sum f_i x_i}{\sum f_i} = \dfrac{281}{40} = 7.025.$

Q6) Find the mean of the following data:

x:	19	21	23	25	27	29	31
f :	13	15	16	18	16	15	13

Solution:

Calculation of Mean

x_i	f_i	$x_i f_i$
19	13	247
21	15	315
23	16	368
25	18	450
27	16	432
29	15	435
31	13	403
Total	$\sum f_i = N = 106$	$\sum f_i x_i = 2650$

$$\therefore \text{Mean} = \frac{\sum f_i x_i}{\sum f_i} = \frac{2650}{106} = 25.$$

Q7) The mean of the following data is 20.6. Find the value of p.

x :	10	15	p	25	35
f :	3	10	25	7	5

Solution:

Calculation of Mean

X_i	f_i	$x_i f_i$
10	3	30
15	10	150
p	25	25p
25	7	175
35	5	175
Total	$\sum f_i = 50$	$\sum f_i x_i = 530 + 25p$

We have:

$$\therefore \text{Mean} = \frac{\sum f_i x_i}{\sum f_i}$$

$$\Rightarrow 20.6 = \frac{530 + 25p}{50}$$

$$\Rightarrow 530 + 25p = 20.6 \times 50$$

$$\Rightarrow 25p = 1030 - 530$$

$$\Rightarrow p = \frac{500}{25}$$

$$\Rightarrow p = 20$$

Q8) If the mean of the following data is 15, find p.

x :	5	10	15	20	25
f:	6	p	6	10	5

Solution:

Calculation of Mean

X_i	f_i	$x_i f_i$
5	6	30
10	p	10p
15	6	90
20	10	200
25	5	125

Total	$\sum f_i = 27 + p$	$\sum f_i x_i = 445 + 10p$

We have:

$\sum f_i = 27 + p$, $\sum f_i x_i = 445 + 10p$

$\therefore$ Mean $= \dfrac{\sum f_i x_i}{\sum f_i}$

$\Rightarrow 15 = \dfrac{445 + 10p}{27 + p}$

$\Rightarrow 445 + 10p = 405 + 15p$

$\Rightarrow 5p = 445 - 405$

$\Rightarrow p = \dfrac{40}{5}$

$\Rightarrow p = 8$.

Q9) Find the value of p for the following distribution whose mean is 16.6

x: 8   12   15   p   20   25   30

f: 12   16   20   24   16   8   4

Solution:

Calculation of Mean

x_i	f_i	$x_i f_i$
8	12	96
12	16	192
15	20	300
p	24	24p
20	16	320
25	8	200
30	4	120
Total	$\sum f_i = N = 100$	$\sum f_i x_i = 1228 + 24p$

We have:

$\sum f_i = 100$, $\sum f_i x_i = 1228 + 24p$

$\therefore$ Mean $= \dfrac{\sum f_i x_i}{\sum f_i}$

$\Rightarrow 16.6 = \dfrac{1228 + 24p}{100}$

$\Rightarrow 1228 + 24p = 16.6 \times 100$

$\Rightarrow 24p = 1660 - 1228$

$\Rightarrow p = \dfrac{432}{24}$

$\Rightarrow p = 18$.

Q10) Find the missing value of p for the following distribution whose mean is 12.58

x :	5	8	10	12	p	20	25
f:	2	5	8	22	7	4	2

Solution:

Calculation of Mean

x_i	f_i	$x_i f_i$
5	2	10
8	5	40
10	8	80
12	22	264
p	7	7p
20	4	80
25	2	50
Total	$\sum f_i = N = 50$	$\sum f_i x_i = 524 + 7p$

We have:

$\sum f_i = 50, \sum f_i x_i = 524 + 7p$

$\therefore \text{Mean} = \frac{\sum f_i x_i}{\sum f_i}$

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

$\Rightarrow 524 + 7p = 12.58 \times 50$

$\Rightarrow 7p = 629 - 524$

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

$\Rightarrow p = 15.$

Q11) Find the missing frequency (p) for the following distribution whose mean is 7.68

x:	3	5	7	9	11	13
f:	6	8	15	p	8	4

Solution:

Calculation of Mean

x_i	f_i	$x_i f_i$
3	6	10
5	8	40
7	15	80

9	p	264
11	8	7p
13	4	80
Total	$\sum f_i = 41 + p$	$\sum f_i x_i = 303 + 9p$

We have:

$\sum f_i = 41 + p, \sum f_i x_i = 303 + 9p$

$\therefore$ Mean $= \frac{\sum f_i x_i}{\sum f_i}$

$\Rightarrow 7.68 = \frac{303 + 9p}{41 + p}$

$\Rightarrow 303 + 9p = 314.88 + 7.68p$

$\Rightarrow 1.32p = 314.88 - 303$

$\Rightarrow p = \frac{11.88}{1.32}$

$\Rightarrow p = 9.$

Q12) Find the value of p, if the mean of the following distribution is 20

x:	15	17	19	20+p	23
f:	2	3	4	5p	6

Solution:

Calculation of Mean

x_i	f_i	$x_i f_i$
15	2	30
17	3	51
19	4	76
20 + p	5p	(20 + p) 5p
23	6	138
Total	$\sum f_i = 15 + 5p$	$\sum f_i x_i = 295 + (20+p) 5p$

We have:

$\sum f_i = 15 + 5p, \sum f_i x_i = 295 + (20+p) 5p$

$\therefore$ Mean $= \frac{\sum f_i x_i}{\sum f_i}$

$\Rightarrow 20 = \frac{(295 + (20+p)5p)}{15 + 5p}$

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

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

=> $5p^2 = 5$

=> $p^2 = 1$

=> $p = 1$.