RD SHARMA

Solutions

Class 10 Maths

Chapter 7

Ex 7.1

Q.1: Calculate the mean for the following distribution:

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

Sol:

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

Mean = 281/4 =7.025

2. Find the mean of the following data:

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

Soln:

X	f	fx
18	13	247
21	15	315
23	16	368

25	**18**	**450**
27	**16**	**432**
29	**15**	**435**
31	**13**	**403**
	N = 106	**Sum = 2620**

Mean (x) = 2680/106 = 25

3. If 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**

Soln:

X	f	fx
10	3	30
5	10	150
P	25	25p
25	7	175
35	5	175
	N = 106	Sum = 2620

Given

Mean = 20.6

(530+25p)/50 = 20.6

25p = 20.6

P = 20

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

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

Soln:

X	f	fx
5	6	30
10	P	10p
15	6	90
20	10	200
25	5	125
	N = p127	Sum = 10p + 445

Given

Mean =15

(10p + 445)/(p+27) = 15

10p + 445 = 15p +405

15p – 10p = 445 – 405

5p = 40

P = 8

5.Find the value of p for the following distribution whose mean is 16.6

X:	**8 20**	**12 25**	**15 30**	**p**	
F:	**12**	**16**	**20**	**24**	**16**

	8	**4**

Soln:

X	f	fx
8	12	96
12	12	192
15	20	300
P	24	24p
20	16	320
25	8	200
30	4	120
	N = 100	Sum = 24p + 1228

Given

Mean = 16.6

(24p+1228)/100 = 16.6

24p + 1228 = 1660

24p = 1660 – 1228

P = 432/24

P = 18

6. 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

Soln:

x	f	fx
5	2	10
8	5	40
10	8	80
12	22	264
P	7	7p
20	24	480
25	2	50
	N = 50	Sum = 524 + 7p

Given mean = 12.58

Sum/N = 12.58

(524 +7p)/50 = 12.58

524 + 7p = 629

7p = 105

P = 15

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

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

Soln:

X	f	fx
3	6	18
5	8	40
7	15	105
9	p	9p
11	8	88
13	4	52
	N = P + 41	Sum 9p = 303

Given

Mean = 7.68

(7p+303)/p+41 =7.68

9p + 303 = p(7.68) + 314.88

9p – p(7.68) = 314.88 – 303

1.32p = 11.88

P = (11.88)/1.32

P = 9

8.The following table gives the number of boys of a particular age in a class of 40 students. Calculate the mean age of the students.

Ages (in years):	**15**	**16**	**17**	**18**	**19**	**20**
No of students:	**3**	**8**	**10**	**10**	**4**	**5**

Soln:

x	f	fx
15	3	45
16	8	128
17	10	170
18	10	180
19	5	95
20	4	80
	N = 40	Sum = 698

Mean age = sum/ N

= 698/ 40

= 17.45 years

9.Candidates of four schools appear in a mathematics test. The data were as follows:

Schools	**No of candidates**	**Average score**
I	**60**	**75**
II	**48**	**80**
III	**P**	**55**
IV	**40**	**50**

If the average score of the candidates of all the four schools is 66, find the number of candidates that appeared from school III.

Soln: Let the number candidates from school III = P

Schools	No of candidates N_i	Average scores (x_i)
I	60	75
II	48	80
III	P	55
IV	40	50

Given

Average score or all schools = 66

$N_1\overline{x}_1+N_2\overline{x}_2+N_3\overline{x}_3+N_4\overline{x}_4 N_1+N_2+N_3+N_4 \frac{N_1\overline{x_1}+N_2\overline{x_2}+N_3\overline{x_3}+N_4\overline{x_4}}{N_1+N_2+N_3+N_4}$ 4500+3340+55p+200060+48+p+40

$\frac{4500+3340+55p+2000}{60+48+p+40}$

10340 + 55p = 66p + 9768

10340 – 9768 = (66 – 55)p

P = 572/11

P = 52

10.Five coins were simultaneously tossed 1000 times and at each toss, the number of heads was observed. The number of tosses during which 0, 1, 2, 3, 4 and 5 heads were obtained are shown in the table below. Find the mean number of heads per toss.

No of heads per toss	**No of tosses**
0	**38**
1	**144**
2	**342**
3	**287**
4	**164**
5	**25**
Total	**1000**

Soln:

No of heads per toss	No of tosses
0	38
1	144
2	342
3	287
4	164
5	25

No of heads per toss	No of tosses	fx
0	38	0
1	144	144
2	342	684
3	287	861
4	164	656
5	25	125

Mean number of heads per toss = 2470/1000 = 2.47

Mean = 2.47

12.The arithmetic mean of the following data is 25. Find the value of k.

X_i:	**5**	**15**	**25**	**35**	**45**
f_i:	**3**	**k**	**3**	**6**	**2**

Sol:

X	f	fx
5	3	15
15	k	15k
25	3	75
35	6	210
45	2	90
	N = k + 120	Sum = 15k + 390

Given mean = 25

Sum/ N = 25

15k + 390 = 25k + 350

25k – 15k = 40

10k = 40

k = 4

13. If the mean of the following data is 18.75. Find the value of p.

X_i:	10	15	p	25	30
F_i:	5	10	7	8	2

Soln:

X	f	fx
10	5	50
15	10	150
P	7	7p
25	8	200

30	2	60
	N = k + 120	Sum = 1p + 460

Given mean = 18.75

Sum/ N = 1.75

7p + 460 = 600

7p = 140

P = 20

14.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**

Soln:

X	f	fx
15	2	30
17	3	51
19	4	76
20 + p	5p	$100p+5p^2$
23	6	138
	N = 5p +15`	Sum = 295 +100p $+5p^2$

Given Mean= 2n

Sum/ N = 20

$(295 + 100p – 5p^2) / (5 + 15) = 20$

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

$5p^2 - 5 = 0$

$5(p^2 - 1) = 0$

$P^2 - 1 = 0$

$P = (+1 , -1)$

If $p + 1 = 0$

$P = -1$

Or $p - 1 = 0$

$P = 1$

15.Find the missing frequencies in the following frequency distribution if it is known that the mean of the distribution is 50.

X:	**10**	**30**	**50**	**70**	**90**
f:	**17**	**f_1**	**32**	**f_2**	**19**

Soln:

x	f	fx
10	17	170
30	f_1	$30f_1$
50	32	1600
70	f_2	$70f_2$
90	19	1710
	N = 120	Sum = $30f_1+70f_2+3480$

Given mean

Sum/ N = 50

$30f_1+70f_2+3480/ 120 = 50$

$30f_1+70f_2+3480 = 6000$ —- (1)

Also, sum of f = 120

$17 + f_1 + 32 + f_2 + 19 = 120$

$f_1 + f_2 = 52$

$f_1 = 52 – f_2$

Substituting the value of f_1 in (1)

$30 (52 – f_2) +70f_2 + 3480 = 6000$

$f_2 = 24$

Hence $f_1 = 52 -24 = 28$

$f_1 =28$; $f_2 = 24$