NCERT Solutions for Class 10 Maths Chapter 14 Statistics

EXERCISE 14.1:

1. A survey was conducted by a group of students as a part of their environment awareness program, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house

Number of plants	0 - 2	2 – 4	4 - 6	6 - 8	8 - 10	10 - 12	12 -14
Number of houses	1	2	1	5	6	2	3

Which method did you use for finding the mean, and why?

Solution: The above given data can be represented in the form of table as below:

Class Interval	fi	xi	fixi
0-2	1	1	1
2-4	2	3	6
4-6	1	5	5
6-8	5	7	35
8-10	6	9	54
10-12	2	11	22
12-14	3	13	39
	∑fi = 20		∑fixi = 162

Mean can be calculated as follows:

$$\bar{x} = \frac{\sum fixi}{\sum fi}$$

$$= \frac{162}{20}$$

= 8.1

We will use the direct method in this as the values of xi and fi are small.

2. Consider the following distribution of daily wages of 50 workers of a factory

Daily wages (in Rs)	100 – 120	120 - 140	140 - 160	160 - 180	180 - 200
Number of workers	12	14	8	6	10

Find the mean daily wages of the workers of the factory by using an appropriate method

Solution: The above given data can be represented in the form of table as below:

Class Interval	fi	xi	di = xi - a	fidi
100-120	12	110	-40	-480
120-140	14	130	-20	-280
140-160	8	150	0	0
160-180	6	170	20	120
180-200	10	190	40	400

	∑fi = 50			∑fidi = -240

Now, mean of the deviation can be calculated as follows:

$$\bar{d} = \frac{\sum \text{fidi}}{\sum \text{fi}}$$

$$= \frac{-240}{50}$$

= -4.8

Mean can be calculated as follows:

x = d + a

x = -4.8 + 150

x = 145.20

3. The following distribution shows the daily pocket allowance of children of a locality

The mean pocket allowance is Rs 18. Find the missing frequency f

Daily pocket allowance (in Rs)	11 - 13	13 - 15	15 - 17	17 - 19	19 - 21	21 - 23	23 - 25
Number of children	7	6	9	13	f	5	4

Solution: The above given data can be represented in the form of table as below:

Class Interval	fi	xi	fixi
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
	∑fi = 44 + f		∑fixi = 752 + 20f

We can find the value of f as follows:

$$\bar{x} = \frac{\sum fixi}{\sum fi}$$

$$18 = \frac{752+20f}{44+f}$$

18(44 + f) = 752 + 20f

792 + 18f = 752 + 20f

2f = 40

F = 20

4. Thirty women were examined in a hospital by a doctor and the number of heart beats per minute were recorded and summarised as follows. Find the mean heart beats per minute for these women, choosing a suitable method

Number of heart beats per minute	65 – 68	68 - 71	71 - 74	74 - 77	77 - 80	80 - 83	83 - 86
Number of women	2	4	3	8	7	4	2

Solution: The above given data can be represented in the form of table as below:

Class Interval	fi	xi	di = xi - a	fidi
65-68	2	66.5	-9	-18
68-71	4	69.5	-6	-24
71-74	3	72.5	-3	-9
74-77	8	75.5	0	0
77-80	7	78.5	3	21
80-83	4	81.5	6	24
83-86	2	84.5	9	18
	∑fi = 30			∑fidi = 12

Now, mean of the deviation can be calculated as follows:

$$\bar{d} = \frac{\sum \text{fidi}}{\sum \text{fi}}$$

$$= \frac{12}{30}$$

= 0.4

Mean can be calculated as follows:

$\bar{x} = \bar{d} + a$

= 0.4 + 75.5

= 75.9

5. In a retail market, fruit vendors were selling mangoes kept in packing boxes. These boxes contained varying number of mangoes. The following was the distribution of mangoes according to the number of boxes

Number of mangoes	50 - 52	53 - 55	56 - 58	59 - 61	62 - 64
Number of boxes	15	110	135	115	25

Find the mean number of mangoes kept in a packing box. Which method of finding the mean did you choose?

Solution: The above given data can be represented in the form of table as below:

Class Interval	fi	xi	di = x - a	fidi
50-52	15	51	-6	90
53-55	110	54	-3	-330
56-58	135	57	0	0
59-61	115	60	3	345
62-64	25	63	6	150
	∑fi = 400			∑fidi = 75

Now, mean of the deviation can be calculated as follows:

$$\bar{d} = \frac{\sum \text{fidi}}{\sum \text{fi}}$$

$$= \frac{75}{400}$$

= 0.1875

Mean can be calculated as follows:

$$\bar{x} = \bar{d} + a$$

= 0.1875 + 57

= 57.1875

6. The table below shows the daily expenditure on food of 25 households in a locality

Daily expenditure (in Rs)	100 - 150	150 - 200	200 - 250	250 - 300	300 - 350
Number of households	4	5	12	2	2

Find the mean daily expenditure on food by a suitable method

Solution: The above given data can be represented in the form of table as below:

Class Interval	fi	xi	di = xi - a	ui = $\frac{di}{h}$	fiui
100-150	4	125	-100	-2	-8

150-200	5	175	-50	-1	-5
200-250	12	225	0	0	0
250-300	2	275	50	1	2
300-350	2	325	100	2	4
	∑fi = 25				∑fiui = -7

$$\bar{x} = a + \frac{\sum \text{fiui}}{\sum \text{fi}} \times h$$

$$= 225 + \frac{-7}{25} \times 50$$

= 211

7. To find out the concentration of SO2 in the air (in parts per million, i.e., ppm), the data was collected for 30 localities in a certain city and is presented below:

Concentration of SO_2 (in ppm)	Frequency
0.00 - 0.04	4
0.04 - 0.08	9
0.08 - 0.12	9
0.12 - 0.16	2
0.16 - 0.20	4

0.20 - 0.24	2

Find the mean concentration of SO_2 in the air

Solution: The above given data can be represented in the form of table as below:

Class interval	fi	xi	fixi
0.00-0.04	4	0.02	0.08
0.04-0.08	9	0.06	0.54
0.08-0.12	9	0.10	0.90
0.12-0.16	2	0.14	0.28
0.16-0.20	4	0.18	0.72
0.20-0.24	2	0.22	0.44
	∑fi = 30		∑fixi = 2.96

Mean can be calculated as follows:

$$\bar{x} = \frac{\sum \text{fixi}}{\sum \text{fi}}$$

$$= \frac{2.96}{30}$$

= 0.099 ppm

8. A class teacher has the following absentee record of 40 students of a class for the whole term. Find the mean number of days a student was absent

Number of days	0 - 6	6 - 10	10 - 14	14 - 20	20 - 28	28 - 38	38 - 40
Number of students	11	10	7	4	4	3	1

Solution: The above given data can be represented in the form of table as below:

Class Interval	fi	xi	fixi
0-6	11	3	33
6-14	10	8	80
14-20	7	12	84
20-28	4	17	68
28-38	4	24	96
38-40	3	33	99
	1	39	39
	∑fi = 40		∑fixi = 499

Mean can be calculated as follows:

$$\bar{x} = \frac{\sum \text{fixi}}{\sum \text{fi}}$$

$$= \frac{499}{40}$$

= 12.4 (approx.)

9. The following table gives the literacy rate (in percentage) of 35 cities. Find the mean literacy rate

Literacy rate (in %)	45 - 55	55 - 65	65 - 75	75 - 85	85 - 95
Number of cities	3	10	11	8	3

Solution: The above given data can be represented in the form of table as below:

Class Interval	fi	xi	ui	fiui
45-55	3	50	-2	-6
55-65	10	60	-1	-10
65-75	11	70	0	0
75-85	8	80	1	8
85-95	3	90	2	6
	∑fi= 35			∑fiui= -2

$$\bar{x} = a + \frac{\sum \text{fiui}}{\sum \text{fi}} \times h$$

$$= 70 + \frac{-2}{35} \times 10$$

= 69.42