RD SHARMA

Solutions

Class 9 Maths

Chapter 22

Ex 22.2

Q1. Define cumulative frequency distribution.

Solution 1: Cumulative frequency distribution:

A table which displays the manner in which cumulative frequencies are distributed over various classes is called a cumulative frequency distribution or cumulative frequency distribution table.

Q2. Explain the difference between a frequency distribution and a cumulative frequency distribution.

Solution 2:

Frequency table or frequency distribution is a method to represent raw data in the form from which one can easily understand the information contained in a raw data, where as a table which plays the manner in which cumulative frequencies are distributed over various classes is called a cumulative frequency distribution.

Q3. The marks scored by 55 students in a test are given below:

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35
No. of students	2	6	13	17	11	4	2

Prepare a cumulative frequency table

Solution 3:

Marks	No. of students	Marks	Cumulative Frequency
0-5	2	Less than 5	2
5-10	6	Less than 10	8
10-15	13	Less than 15	21
15-20	17	Less than 20	38
20-25	11	Less than 25	49
25-30	4	Less than 30	53
30-35	2	Less than 35	55
	N=55		

Q4. Following are the ages of 360 patients getting medical treatment in a hospital on a day.

Age(in years)	10-20	20-30	30-40	40-50	50-60	60-70
No of patients	90	50	60	80	50	30

Construct a cumulative frequency table.

Solution 4:

Age (in years)	No. of students	Marks	Cumulative Frequency

10-20	90	Less than 20	90
20-30	50	Less than 30	140
30-40	60	Less than 40	200
40-50	80	Less than 50	280
50-60	50	Less than 60	330
60-70	30	Less than 70	360
	N=360		

Q5. The water bills (in rupees) of 32 houses in a certain street for the period 1.198 to 31.398 are given below:

56,43,32,38,56,24,68,85,52,47,35,58,63,74,27,84,69,35,44,75,55,30,54,65,45,67,95,72,43,65,35,69.

Tabulate the data and present the data as a cumulative frequency table using 70-79 as one of the class intervals.

Solution 5:

The minimum bill is Rs 24

The maximum bill is Rs 95

Range=Maximum bill-Minimum bill=95-24=71

Given class interval is 70-79.So, class size=79-70=9

Therefore number of classes= $\frac{\text{Range}}{\text{classsize}} = \frac{71}{9} = 7.80$

Number of classes=8

The cumulative frequency distribution is as follows:

Bills	No. of houses(frequency)	Cumulative frequency
16-25	1	1
25-34	3	4
34-43	5	9
43-52	4	13
52-61	7	20
61-70	6	26
70-79	3	29
79-88	2	31
88-97	1	32

Q6.The number of books in different shelves of a library is as follows:

30, 32, 28, 24, 20, 25, 38, 37, 40, 45, 16, 20

19, 24, 27, 30, 32, 34, 35, 42, 27, 28, 19, 34

38, 39, 42, 29, 24, 27, 22, 29, 31, 19, 27, 25

28, 23, 24, 32, 34, 18, 27, 25, 37, 31, 24, 23

43, 32, 28, 31, 24, 23, 26, 36, 32, 29, 28, 21.

Prepare a cumulative frequency distribution table using 45-49 as the last class-interval.

Solution 6:

The minimum number of bookshelves is 16

and maximum number of bookshelves is 45

Range=Maximum book shelves-Minimum book shelves=45-16=29

Given class interval is 45-49.So, class size=49-45=4

Therefore number of classes= $\frac{\text{Range}}{\text{classsize}} = \frac{29}{4} == 7.25$

Number of classes=8

The cumulative frequency distribution is as follows:

No of books	No. of shelves(frequency)	Cumulative frequency
13-17	1	1
17-21	6	7
21-25	11	18
25-29	15	33
29-33	12	45
33-37	5	50
37-41	6	56
41-45	3	59
45-49	1	60

Q7. Given below are the cumulative frequencies showing the weights of 685 students of a school. Prepare a frequency distribution table.

Weight(in kg)	No. of students
Below 30	0
Below 30	24

Below 35	78
Below 40	183
Below 45	294
Below 50	408
Below 55	543
Below 60	621
Below 65	674
Below 70	685

Solution 7:

Weight(in kg)	No. of students	Class interval	frequency
Below 30	24	25-30	24-0=24
Below 35	78	30-35	78-24=54
Below 40	183	35-40	183-78=105
Below 45	294	40-45	294-183=111
Below 50	408	45-50	408-294=114
Below 55	543	50-55	543-408=135
Below 60	621	55-60	621-543=78
Below 65	674	60-65	671-621=53
Below 70	685	65-70	685-671=11

Q8. The following cumulative frequency distribution table shows the daily electricity consumption (in KW) of 40 factories in an industrial state.

Consumption(in KW)	No. of factories
Below 240	1
Below 270	4
Below 300	8
Below 330	24
Below 360	33

Below 390	38
Below 420	40

(1) Represent this as a frequency distribution table.

(2)Prepare a cumulative frequency table.

Solution 8:

(1)

Consumption(in KW)	No. of factories	Class interval	Frequency
Below 240	1	0-240	1
Below 270	4	240-270	4-1=3
Below 300	8	270-300	8-4=4
Below 330	24	300-330	24-8=16
Below 360	33	330-360	33-24=9
Below 390	38	360-390	38-33=5
Below 420	40	390-420	40-38=2

(2)

Class interval	Frequency	Consumption(in KW)	No. of factories
0-240	1	More than 0	40
240-270	3	More than 240	40-1=39
270-300	4	More than 270	39-3=36
300-330	16	More than 300	36-4=32
330-360	9	More than 330	32-16=16
360-390	5	More than 360	16-9=7
390-420	2	More than 390	7-5=2
		More than 420	2-2=0
	N=40		

Q9. Given below is a cumulative frequency distribution table showing ages of the people living in a locality:

Age in years	No. of years
Above 108	0
Above 96	1
Above 84	3
Above 72	5
Above 60	20
Above 48	158
Above 36	427
Above 24	809
Above 12	1026
Above 0	1124

Prepare a frequency distribution table.

Solution 9:

Age (in years)	No. of persons	Class interval	Frequency
Above 0	1124	0-12	1124-1026=98
Above 12	1026	12-24	217
Above 24	809	24-36	382
Above 36	427	36-48	269
Above 38	158	48-60	138
Above 60	20	60-72	15
Above 72	5	72-84	5-3=2
Above 84	3	84-96	3-1=2
Above 96	3	96-108	1-0=1