EXERCISE 22.1 PAGE NO: 22.5

1. Define the following terms:
(i) Observations
(ii) Data
(iii) Frequency of an observation
(iv) Frequency distribution

Solution:
(i) Observation is the activity of paying close attention to someone or something in order to get information in numerical form.

(ii) Data: The collection of observations is known as data.

(iii) Frequency of an observation: The number of times an observation occurs in a given data is called the frequency of an observation.

(iv) Frequency distribution: It is a method of presenting raw data in a form that can be easily understood.

2. The final marks in Mathematics of 30 students are as follows:
53, 61, 48, 60, 78, 68, 55, 100, 67, 90
75, 88, 77, 37, 84, 58, 60, 48, 62, 56
44, 58, 52, 64, 98, 59, 70, 39, 50, 60
(i) Arrange these marks in the ascending order. 30 to 39 one group, 40 to 49 second group, etc.
(ii) What is the highest score?
(iii) What is the lowest score?
(iv) What is the range?
(v) If 40 is the pass mark how many have failed?
(vi) How many have scored 75 or more?
(vii) Which observations between 50 and 60 have not actually appealed?
(viii) How many have scored less than 50?

Solution:
(i) Ascending order of the numbers in groups:

(30-39): 37, 39
(40 – 49): 44, 48, 48
(50 – 59): 50, 52, 53, 55, 56, 58, 58, 59
(60 – 69): 60, 60, 60, 61, 62, 64, 67, 68
(70 – 79): 70, 75, 77, 78
(80 – 89): 84, 88
(90 – 99): 90, 98
(100-109): 100

(ii) The highest score is 100.

(iii) The lowest score is 37.

(iv) Range is = Maximum observation – Minimum observation.
= 100 – 37
= 63.

(v) If 40 is the pass mark, then only 2 students have failed.

(vi) 8 students have scored 75 or more.

(vii) 51, 54 and 57 are not there between 50 and 60.

(viii) 5 students scored less than 50.

3. The weights of new born babies (in kg) in a hospital on a particular day are as follows:
2.3, 2.2, 2.1, 2.7, 2.6, 3.0, 2.5, 2.9, 2.8, 3.1, 2.5, 2.8, 2.7, 2.9, 2.4
(i) Rearrange the weights in descending order.
(ii) Determine the highest weight.
(iii) Determine the lowest weight.
(iv) Determine the range.
(v) How many babies were born on that day?
(vi) How many babies weigh below 2.5 kg?
(vii) How many babies weigh more than 2.8?
(viii) How many babies weigh 2.8 kg?

Solution:
(i) Weights in descending order:
3.1, 3.0, 2.9, 2.9, 2.8, 2.8, 2.7, 2.7, 2.6, 2.5, 2.5, 2.4, 2.3, 2.2, 2.1

(ii) Highest weight: 3.1 Kg.

(iii) Lowest weight: 2.1 Kg.

(iv) Range = Maximum observation – Minimum observation
= (3.1-2.1) kg
= 1.0 Kg.

(v) A total of 15 babies were born on that day.

(vi) 4 babies weigh below 2.5 kg.

(vii) 4 babies weigh more than 2.8 kg.

(viii) 2 babies weigh 2.8 kg.

4. Following data gives the number of children in 40 families:
1, 2, 6, 5, 1, 5, 1, 3, 2, 6, 2, 3, 4, 2, 0, 0, 4, 4, 3, 2
2, 0, 0, 1, 2, 2, 4, 3, 2, 1, 0, 5, 1, 2, 4, 3, 4, 1, 6, 2
Represent it in the form of a frequency distribution.

Solution:
Required frequency table for given data is:

Number of Children	Frequency
0	5
1	7
2	11
3	5
4	6
5	3
6	3

5. Prepare a frequency table of the following scores obtained by 50 students in a test:

42	**51**	**21**	**42**	**37**	**37**	**42**	**49**	**38**	**52**
7	**33**	**17**	**44**	**39**	**7**	**14**	**27**	**39**	**42**
42	**62**	**37**	**39**	**67**	**51**	**53**	**53**	**59**	**41**
29	**38**	**27**	**31**	**54**	**19**	**53**	**51**	**22**	**61**
42	**39**	**59**	**47**	**33**	**34**	**16**	**37**	**57**	**43**

Solution:

Required frequency-distribution table for given data:

Marks	Number of Students
7	2
14	1
16	1
17	1
19	1
21	1
22	1
27	2
29	1
31	1
33	2
34	1
37	4
38	2
39	4
41	1
42	6
43	1
44	1
47	1
49	1
51	3
52	1
53	3
54	1

57	1
59	2
61	1
62	1
67	1

6. A die was thrown 25 times and following scores were obtained:

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

Prepare a frequency table of the scores.

Solution:

Required frequency table:

Score	Number of times
1	5
2	5
3	4
4	3
5	4
6	4

7. In a study of number of accidents per day, the observations for 30 days were obtained as follows:

6 3 5 6 4 3 2 5 4 2
4 2 1 2 2 0 5 4 6 1
6 0 5 3 6 1 5 5 2 6

Prepare a frequency distribution table.

Solution:

Required frequency table for given data:

Number of accidents	Number of Days
0	2
1	3

2	6
3	3
4	4
5	6
6	6

8. Prepare a frequency table of the following ages (in years) of 30 students of class VIII in your school:
13, 14, 13, 12, 14, 13, 14, 15, 13, 14, 13, 14, 16, 12, 14
13, 14, 15, 16, 13, 14, 13, 12, 17, 13, 12, 13, 13, 13, 14

Solution:
Frequency distribution table:

Ages (in years)	Number of Students
12	4
13	12
14	9
15	2
16	2
17	1

9. Following figures relate the weekly wages (in Rs) of 15 workers in a factory:
300, 250, 200, 250, 200, 150, 350, 200, 250, 200, 150, 300, 150, 200, 250
Prepare a frequency table.
(i) What is the range in wages (in Rs)?
(ii) How many Workers are getting Rs 350?
(iii) How many workers are getting the minimum wages?

Solution:
Frequency distribution table is:

Wages (in Rs)	Number of workers
150	3
200	5
250	4
300	2
350	1

(i) The range in wages (in Rs.) = 350 – 150 = 200.

(ii) Only 1 worker is getting Rs. 350.

(iii) 3 workers are getting the minimum wages, i.e., Rs. 150.

10. Construct a frequency distribution table for the following marks obtained by 25 students in a history test in class VI of a school:
9, 17, 12, 20, 9, 18, 25, 17, 19, 9, 12, 9,12, 18, 17,19, 20,25, 9, 12, 17, 19, 19, 20, 9
(i) What is the range of marks?
(ii) What is the highest mark?
(iii) Which mark is occurring more frequently?

Solution:
Required frequency distribution table is:

Marks	Frequency
9	6
12	4
17	4
18	2
19	4
20	3
25	2

(i) Range of marks: 25 – 9 = 16.

(ii) The highest mark is 25.

(iii) 9 is occurring more frequently.

11. In a Mathematics test following marks were obtained by 40 students of class VI. Arrange these marks in a table using, tally marks.

8	**1**	**3**	**7**	**6**	**5**	**5**	**4**	**4**	**2**
4	**9**	**5**	**3**	**7**	**1**	**6**	**5**	**2**	**7**
7	**3**	**8**	**4**	**2**	**8**	**9**	**5**	**8**	**6**
7	**4**	**5**	**6**	**9**	**6**	**4**	**4**	**6**	**6**

(i) Find how many students obtained marks equal to or more than 7?
(ii) How many students obtained marks below 4?

Solution:

Marks	Tally Marks	Frequency
1	||	2
2	|||	3
3	|||	3
4	𝍸 ||	7
5	𝍸 |	6
6	𝍸 ||	7
7	𝍸	5
8	||||	4
9	|||	3

(i) 12 students obtained marks equal to or more than 7.
(ii) Only 8 students obtained marks below 4.

12. Following is the choice of sweets of 30 students of class VI: Ladoo, Barfi, Ladoo, Jalebi, Ladoo, Rasgulla, Jalebi, Ladoo, Barfi, Rasgulla, Ladoo, Jalebi, Jalebi, Rasgulla, Ladoo, Rasgulla, Jalebi, Ladoo, Rasgulla, Ladoo, Rasgulla, Jalebi, Ladoo, Rasgulla, Ladoo, Ladoo, Barfi, Rasgulla. Rasgulla, Ladoo.
(i) Arrange the names of sweets in a table using tally marks.
(ii) Which sweet is preferred by most of the students?

Solution:

Sweets	Tally Marks	Frequency
Ladoo	𝍸 𝍸 ||	12
Barfi	|||	3
Jalebi	𝍸 |	6
Rasgulla	𝍸 ||||	9

(ii) Ladoo is preferred by most of the students, 12 students.