EXERCISE 6.1

Q. No. 1 The following data shows the number of members in various families. Construct frequency distribution. Also find cumulative frequencies.

9, 11, 4, 5, 6, 8, 4, 3, 7, 8, 5, 5, 8, 3, 4, 9, 12, 8, 9, 10, 6, 7, 7, 11, 4, 4, 8, 4, 3, 2, 7, 9, 10, 9, 7, 6, 9, 5, 7

Solution:

Let number of family members = X

X: 9, 11, 4, 5, 6, 8, 4, 3, 7, 8, 5, 5, 8, 3, 4, 9, 12, 8, 9, 10, 6, 7, 7, 11, 4, 4, 8, 4, 3, 2, 7, 9, 10, 9, 7, 6, 9, 5, 7

Minimum Value = $X_{min} = 2$

Maximum value = $X_{max} = 12$

Number of members = n = 39

X	Tally Marks	f	Cumulative Frequency (C.F)
2	I	1	1
3	III	3	1+3=4
4	𝍸 I	6	4+6=10
5	IIII	4	10+4=14
6	III	3	14+3=17
7	𝍸 I	6	17+6=23
8	𝍸	5	23+5=28
9	𝍸 I	6	28+6=34
10	II	2	34+2=36
11	II	2	36+2=38
12	I	1	38+1=39

Q. 2 The following data has been obtained after weighting 40 students of class V.

Make a frequency distribution taking class interval size as 5. Also find the class boundaries and midpoints.

34, 26, 33, 32, 24, 21, 37, 40, 41, 28, 28, 31, 33, 34, 37, 23, 27, 31, 31, 36, 29, 35, 36, 37, 38, 22, 27, 28, 29, 31, 35, 35, 40, 21, 32, 33, 27, 29, 30, 23

Also make a less than cumulative frequency distribution (Hint: Make Classes 20-24, 25-29,……..,)

Solution:

Let weights of students = X

X: 34, 26, 33, 32, 24, 21, 37, 40, 41, 28, 28, 31, 33, 34, 37, 23, 27, 31, 31, 36, 29, 35, 36, 37, 38, 22, 27, 28, 29, 31, 35, 35, 40, 21, 32, 33, 27, 29, 30, 23

Minimum value = $X_{min} = 21$

Maximum value = $X_{max} = 41$

Number of observations = n = 40

Size of class intervals = 5

Classes	Tally Marks	f	Mid points (x)	Class Boundaries
20–24	𝍸 I	6	22	19.5–24.5
25–29	𝍸 𝍸	10	27	24.5–29.5
30–34	𝍸 𝍸 II	12	32	29.5–34.5
35–39	𝍸 IIII	9	34	34.5–39.5
40–44	III	3	39	39.5–44.5
	$\sum f = 40$			

Less than Cumulative Frequency Distribution

C.B	f	C.F	Class Boundaries	F
14.5–19.5	0	0	Less than 19.5	0
19.5–24.5	6	0+6=6	Less than 24.5	6
24.5–29.5	10	6+10=16	Less than 29.5	16
29.5–34.5	12	16+12=28	Less than 34.5	28
34.5–39.5	9	28+9=37	Less than 39.5	37
39.5–44.5	3	37+3=40	Less than 44.5	40

Q. 3 From the following data representing the salaries of 30 teachers of a school. Make a frequency distribution taking class interval size of Rs. 100, 450, 500, 550, 580, 670, 1200, 1150, 1120, 950, 1130, 1230, 890, 780, 760, 670, 880, 890, 1050, 980, 970, 1020, 1130, 1220, 760, 690, 710, 750, 1120, 760, 1240 06(003)

(**Hints:** Make classes 450—549, 550—649,..).

Solution: Let Salaries of teachers are X.

X: 450, 500, 550, 580, 670, 1200, 1150, 1120, 950, 1130, 1230, 890, 780, 760, 670, 880, 890, 1050, 980, 970, 1020, 1130, 1220, 760, 690, 710, 750, 1120, 760, 1240

Minimum value = X_{min} = 450

Maximum value = X_{max}= 1240

Number of observations = n = 30

Size of class intervals = Rs.100

Classes	Tally Marks	Frequency (f)
450–549	II	2
550–649	II	2
650–749	IIII	4
750–849	𝍸	5
850–949	III	3
950–1049	IIII	4
1050–1149	𝍸	5
1150–1249	𝍸	5
		Σf = 30

Q.4 The following data shows the daily load shedding duration in hours in 30 localities of a certain city. Make a frequency distribution of the load shedding duration taking 2 hours as class intervals size and answer the following questions.

6, 12, 5, 7, 8, 3, 6, 7, 10, 2, 14, 11, 12, 8, 6, 8, 9, 7, 11, 6, 9, 12, 13, 10, 14, 7, 6, 10, 11, 14,12.

(a) Find the most frequent load shedding hours

(b) Find least load shedding intervals

(Hint: Make classes 2—3,4—5,6—7,…..)

Solution:

Let load shedding hours are X.

X: 6, 12, 5, 7, 8, 3, 6, 7, 10, 2, 14, 11, 12, 8, 6, 8, 9, 7, 11, 6, 9, 12, 13, 10, 14, 7, 6, 10, 11, 14, 12

Minimum value = X_{min} = 2

Maximum value = X_{max}= 14

Classes	Tally marks	Frequency (f)
2–3	II	2
4–5	I	1
6–7	𝍸 IIII	9
8–9	𝍸	5
10–11	𝍸 I	6
12–13	𝍸	5
14–15	III	3
Total		**Σf = 31**

(a) The most frequent load shedding hours are (6–7)

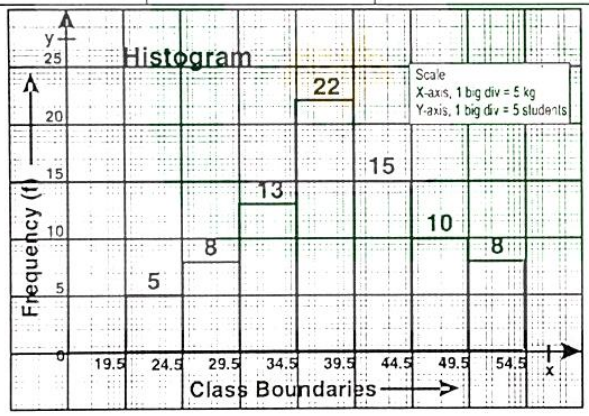
(b) The least load shedding interval is (4–5)

Q.5 Construct a Histogram and frequency Polygon for the following data showing weights of students in Kg.

Weights	Frequency / No. of students
20–24	5
25–29	8
30–34	13
35–39	22
40–44	15
45–49	10
50–54	8

(i) Solution: Histogram

Weights	Frequency (f)	Class Boundaries
20–24	5	19.5–24.5
25–29	8	24.5–29.5
30–34	13	29.5–34.5
35–39	22	34.5–39.5
40–44	15	39.5–44.5
45–49	10	44.5–49.5
50–54	8	49.5–54.5



(ii) Frequency Polygon:

Weights (kg)	(f)	Class Boundaries	Midpoint
15–19	0	14.5–19.5	17
20–24	5	19.5–24.5	22
25–29	8	24.5–29.5	27
30–34	13	29.5–34.5	32
35–39	22	34.5–39.5	37
40–44	15	39.5–44.5	42
45–49	10	44.5–49.5	47
50–54	8	49.5–54.5	52
55–59	0	54.5–59.5	57

Note: Two additional groups with same size of class interval are taken. One before the very first group and the second after the very last group. These two groups will have frequency "0".

Frequency Polygon: