Statistics Ex 14.3

(ii) Out of all won seats, 75 is the maximum. So party A has won maximum number of seats.

Q4. The length of 40 leaves of a plant are measured correct to one millimeter and the obtained data is represented in the following table:

Length (in mm)	Number of leaves
118 – 126	3
127 – 135	5
136 – 144	9
145 – 153	12
154 – 162	5
163 – 171	4
172 – 180	2

(i) Draw a histogram to represent the given data.

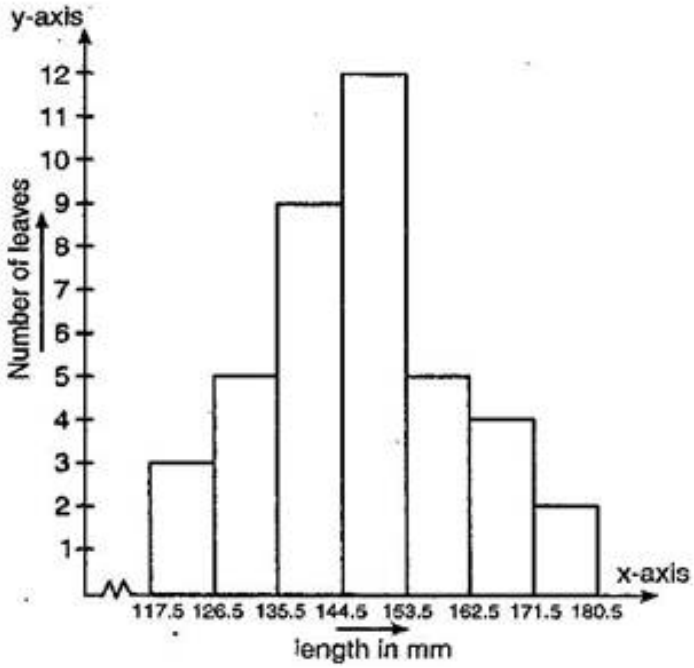
(ii) Is there any other suitable graphical representation for the same data?

(iii) Is it correct to conclude that the maximum number of leaves are 153 mm long? Why?

Ans: (i) Let us find half the difference between lower limit of a class and upper limit of its proceeding class to make the continuous distribution.

Length in mm	Number of leaves
117.5 - 126.5	3
126.5 - 135.5	5
135.5 - 144.5	9
144.5 - 153.5	12
153.5 - 162.5	5
162.5 - 171.5	4
171.5 - 180.5	2

Representation of given data in the form of a histogram is as follows:

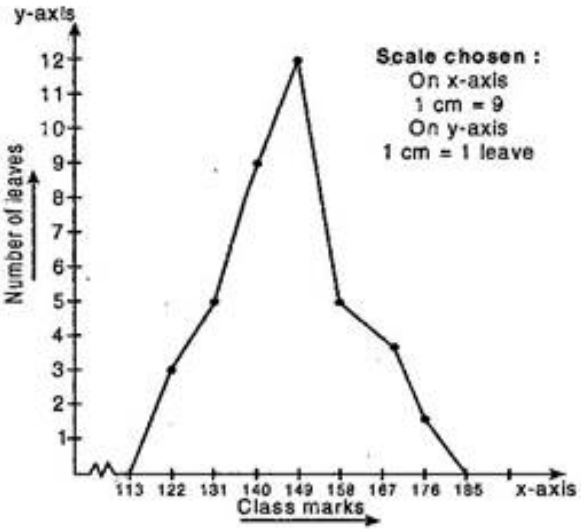


Length of 40 leaves of a plant measured correct to one millimeter.

Scale chosen: On y-axis – 1 large division, i.e. 1 cm = 1 leave

(ii) Yes, we can represent the given data by other graphical representation named as **Frequency Polygon** which is as follows:

Length in mm	Class Mark	Number of leaves
117.5 - 126.5	122	3
126.5 - 135.5	131	5
135.5 - 144.5	140	9
144.5 - 153.5	149	12
153.5 - 162.5	158	5
162.5 - 171.5	167	4
171.5 - 180.5	176	2



(iii) No, because the maximum number 12 is corresponding to the class interval 145 -153

which implies that the leaves whose length are 145 mm or less than 153 mm are maximum in number.

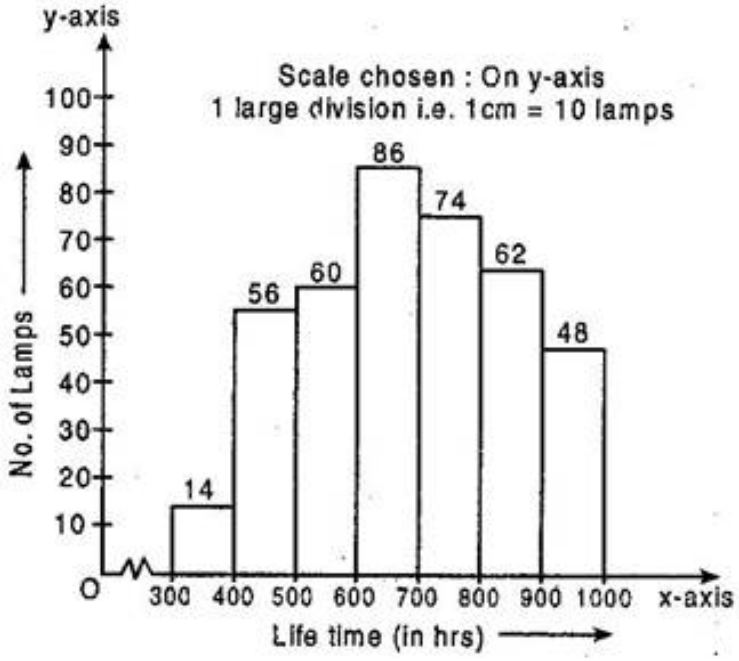
Q5. The following table gives the life times of 400 neon lamps:

Life time (in hours)	Number of lamps
300 – 400	14
400 – 500	56
500 – 600	60
600 – 700	86
700 – 800	74
800 – 900	62
900 – 1000	48

(i) Represent the given information with the help of a histogram.

(ii) How many lamps have a life time of more than 700 hours?

Ans: (i) Representation of the given in the form of histogram is as follows:



(ii) Number of lamps having lifetime of more than 700 hours = 74 + 62 +48 = 184

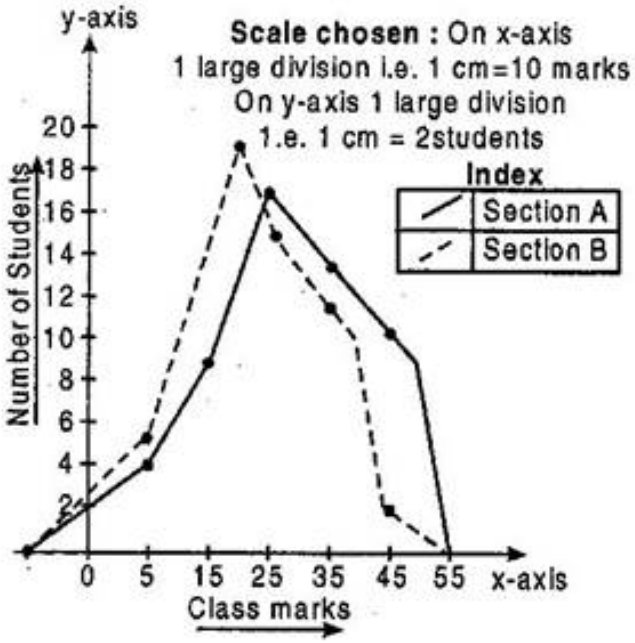
Q6. The following table gives the distribution of students of two sections according to the marks obtained by him:

Section - A		Section - B	
Marks	Frequency	Marks	Frequency
0 – 10	3	0 – 10	5
10 – 20	9	10 – 20	19
20 – 30	17	20 – 30	15
30 – 40	12	30 – 40	10
40 – 50	9	40 – 50	1

Represent the marks of the students of both the sections on the same graph by two frequency polygons. From the two polygons compare the performance of the two sections.

Ans: We plot the class-mark on x-axis and number of students on y-axis.

Marks obtained	Class - marks	No. of students in Section A	No. of students in Section B
0 - 10	5	3	5
10 - 20	15	9	19
20 - 30	25	17	15
30 - 40	35	12	10
40 - 50	45	9	1



From the above graph, we observed that students of section A performed better because as we move right on x-axis the number of students are spread widely over greater marks as compared to the students of section A.

Q7. The runs scored by the two teams A and B in the first 60 balls in a cricket match are given below:

Number of balls	Team A	Team B
0 – 6	2	5
7 – 12	1	6
13 – 18	8	2
19 – 24	9	10
25 – 30	4	5
31 – 36	5	6
37 – 42	6	3
43 – 48	10	4
49 – 54	6	8
55 – 60	2	10

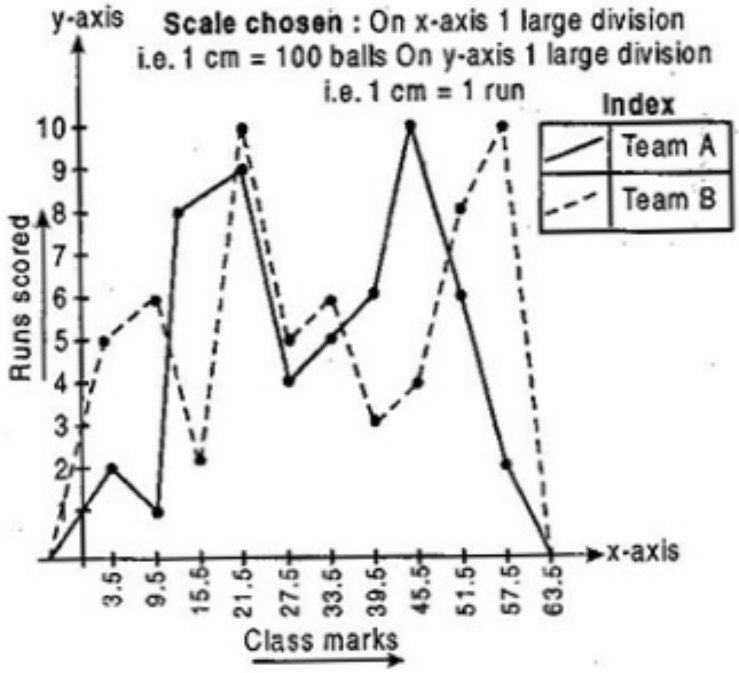
Represent the data of both the teams on the same graph by frequency polygons.

Ans: New series of given data for plotting the frequency polygon:

Lower limit d	Upper limit d	Class boundaries
1 – 0.5 = 0.5	6 + 0.5 = 6.5	0.5 – 6.5
7 – 0.5 = 6.5	12 + 0.5 = 12.5	6.5 – 12.5
13 – 0.5 = 12.5	18 + 0.5 = 18.5	12.5 – 18.5
19 – 0.5 = 18.5	24 + 0.5 = 24.5	18.5 – 24.5
25 – 0.5 = 14.5	30 + 0.5 = 30.5	24.5 – 30.5
31 – 0.5 = 30.5	36 + 0.5 = 36.5	30.5 – 36.5
37 – 0.5 = 36.5	42 + 0.5 = 42.5	36.5 – 42.5
43 – 0.5 = 42.5	48 + 0.5 = 48.5	42.5 – 48.5
49 – 0.5 = 48.5	54 + 0.5 = 54.5	48 .5 – 54.5
55 – 0.5 = 54.5	60 + 0.5 = 60.5	54.5 – 60.5

Number of balls	Class - marks	Runs scored by team A	Runs scored by team B
0 - 10	5	3	5
10 - 20	15	9	19
20 - 30	25	17	15
30 - 40	35	12	10
40 - 50	45	9	1

Frequency polygon of team A and team B



Q8. A random survey of the number of children of various age groups playing in a park was found as follows:

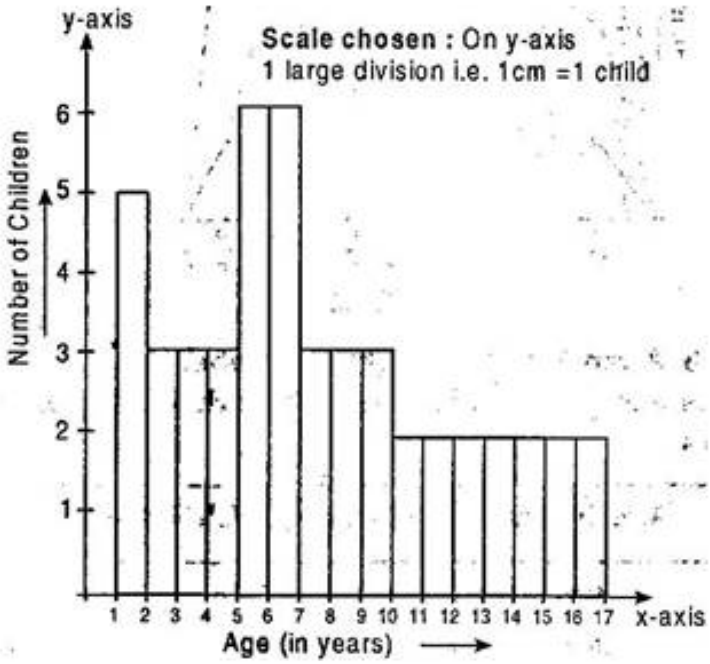
Age (in years)	Number of children
1 – 2	5
2 – 3	3
3 – 5	6
5 – 7	12
7 – 10	9
10 – 15	10
15 – 17	4

Draw a histogram to represent the data above.

Ans: Here the classes are not of equal size. Here minimum class is 1, therefore

Age in years	Frequency	Width	Length of rectangle
1 - 2	5	1	$\frac{5}{1}\times 1=5$
2 - 3	3	1	$\frac{3}{1}\times 1=3$
3 - 5	6	2	$\frac{6}{2}\times 1=3$
5 - 7	12	2	$\frac{12}{2}\times 1=6$
7 - 10	9	3	$\frac{9}{3}\times 1=3$
10 - 15	10	5	$\frac{10}{5}\times 1=2$
15 - 17	4	2	$\frac{4}{2}\times 1=2$

The histogram using these lengths



Q9. 100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the surnames was found as follows:

Number of letters	Number of surnames
1 – 4	6
4 – 6	30
6 – 8	44
8 – 12	16
12 – 20	4

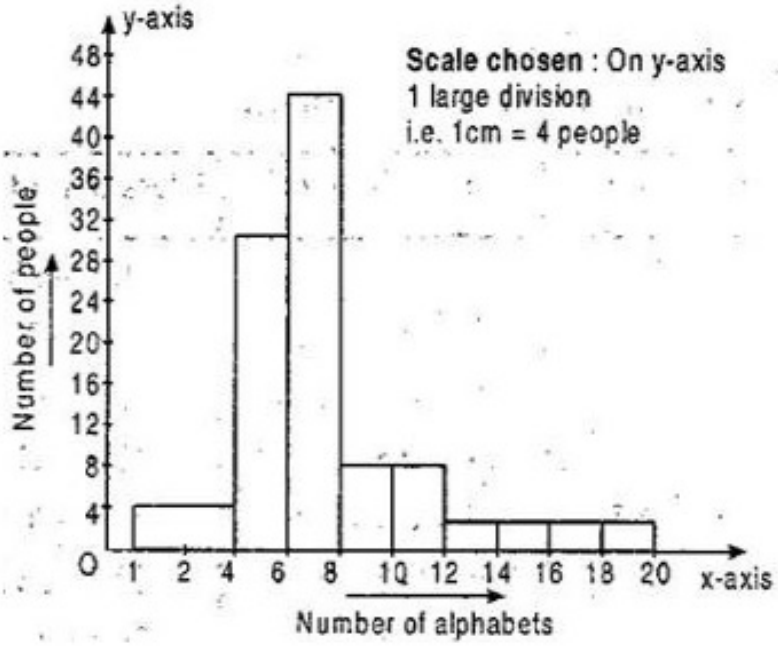
(i) Draw a histogram to depict the given information.

(ii) Write the class interval in which the maximum number of surnames lie.

Ans: Here the classes are not of equal size. Here minimum class is 1, therefore

No. of alphabets	Frequency	Width	Length of rectangle
1 - 4	6	3	$\frac{6}{3}\times 2=4$
4 - 6	30	2	$\frac{30}{2}\times 2=30$
6 - 8	44	2	$\frac{44}{2}\times 2=44$
8 - 12	16	4	$\frac{16}{4}\times 2=8$
12 - 20	4	8	$\frac{4}{8}\times 2=1$

The histogram using these lengths



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