Exercise 12.1

1. *A survey conducted by an organisation for the cause of illness and death among the women between the ages 15–44 (in years) worldwide, found the following figures (in %):*

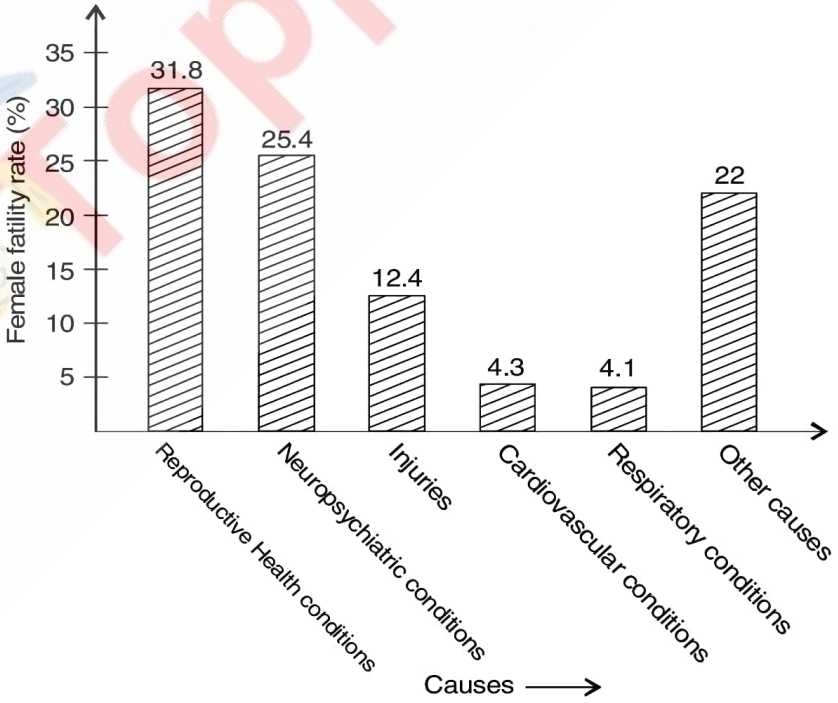
S.No.	*Causes*	*Female fatality rate (%)*
1.	*Reproductive health conditions*	*31.8*
2.	*Neuropsychiatric conditions*	*25.4*
3.	*Injuries*	*12.4*
4.	*Cardiovascular conditions*	*4.3*
5.	*Respiratory conditions*	*4.1*
6.	*Other causes*	*22.0*

(*i*) *Represent the information given above graphically.*

(*ii*) *Which condition is the major cause of women's ill health and death worldwide?*

(*iii*) *Try to find out, with the help of your teacher, any two factors which play a major role in the cause in (ii) above being the major cause.*

Sol. (*i*) Bar graph representing the causes of female fatility rate (in %):



(*ii*) Reproductive health conditions is the major cause of illness and death of women.

(*iii*) Two factors are uneducated and poor background.

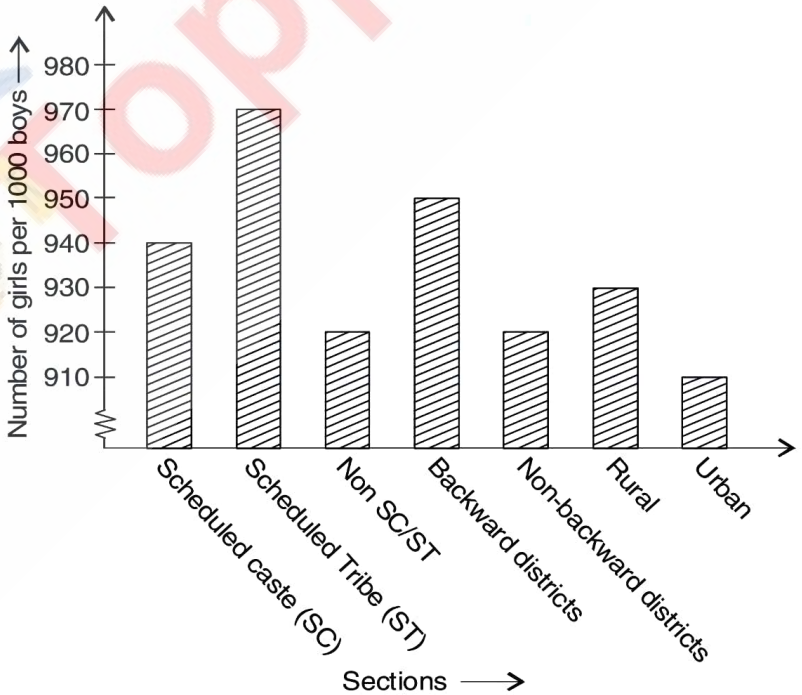
2. *The following data on the number of girls (to the nearest ten) per thousand boys in different sections of Indian society is given below*:

Section	*Number of girls per thousand boys*
Scheduled Caste (SC)	*940*
Scheduled Tribe (ST)	*970*
Non-SC/ST	*920*
Backward districts	*950*
Non-backward districts	*920*
Rural	*930*
Urban	*910*

(*i*) *Represent the information above by a bar graph.*

(*ii*) *In the classroom discuss what conclusions can be arrived at from the graph.*

Sol. (*i*) Bar graph representing the number of girls (to the nearest ten) per thousand boys in different sections of society.



(*ii*) The highest percentage of girls per thousand boys and the lowest percentage of boys per thousand boys in different sections of Indian society are from ST and urban sections respectively.

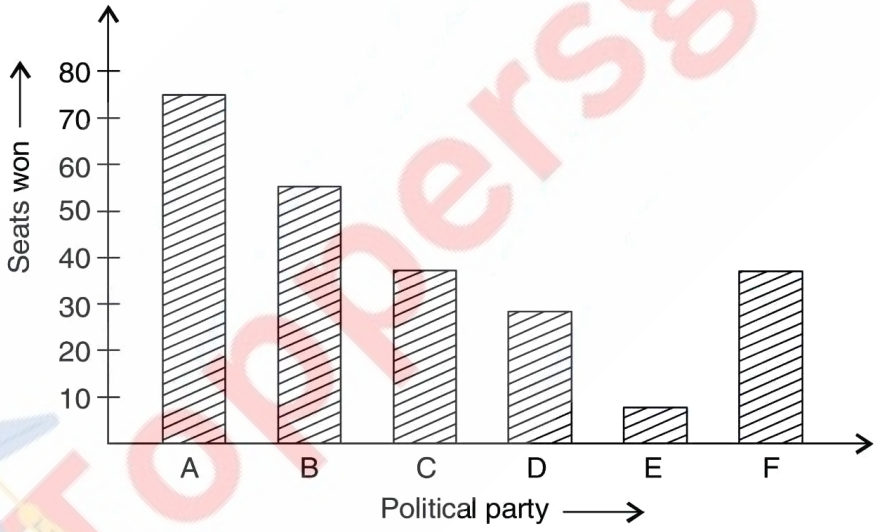
3. *Given below are the seats won by different political parties in the polling outcome of a state assembly elections*:

Political Party	*A*	*B*	*C*	*D*	*E*	*F*
Seats Won	*75*	*55*	*37*	*29*	*10*	*37*

(*i*) *Draw a bar graph to represent the polling results.*

(*ii*) *Which political party won the maximum number of seats?*

Sol. (*i*) Bar graph representing seats won by different political parties in the polling outcome of a state assembly elections:



(*ii*) Party A won the maximum number of seats.

4. *The length of 40 leaves of a plant are measured correct to one millimetre, 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.*
[**Hint.** *First make the class intervals continuous*]

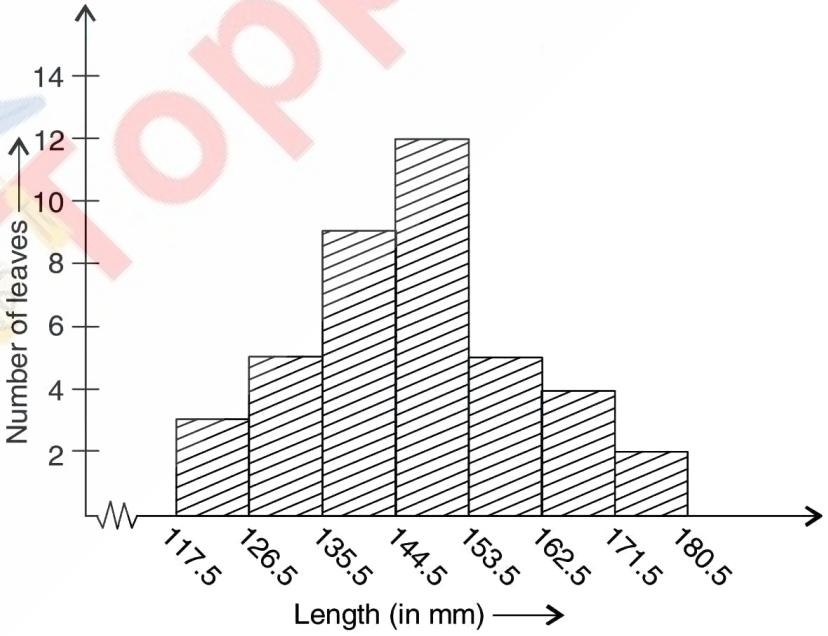
(*ii*) *Is there any other suitable graphical representation for the same data?*

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

Sol. Lengths are not in continuous intervals, first we make continuous intervals.

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

(*i*) Histogram representing the length of leaves (in mm).



(*ii*) Yes, frequency polygon is another graphical representation for the same data.

(*iii*) No. The given data are in class intervals.

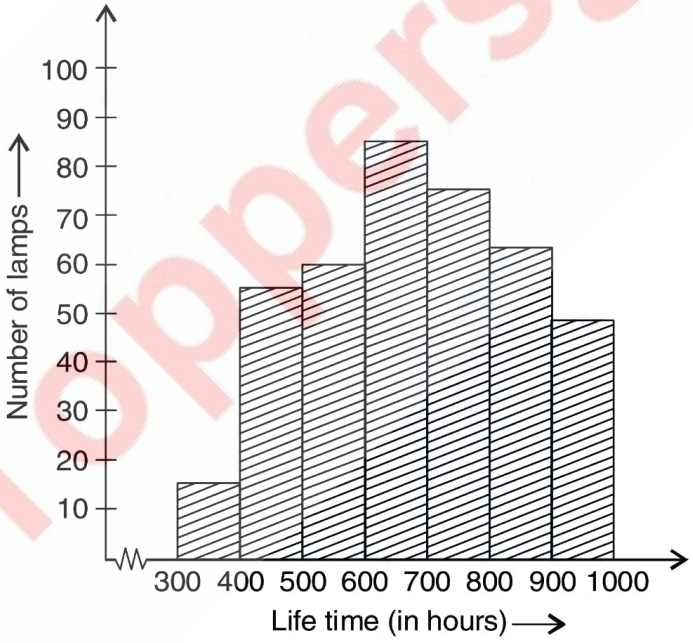
5. *The following table gives the life times of 400 neon lamps*:

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?*

Sol. (*i*) Histogram representing the life times of neon-lamps:



(*ii*) Number of lamps having life time more than 700 hours is
(74 + 62 + 48), *i.e.*, 184.

6. *The following table gives the distribution of students of two sections according to the marks obtained by them*:

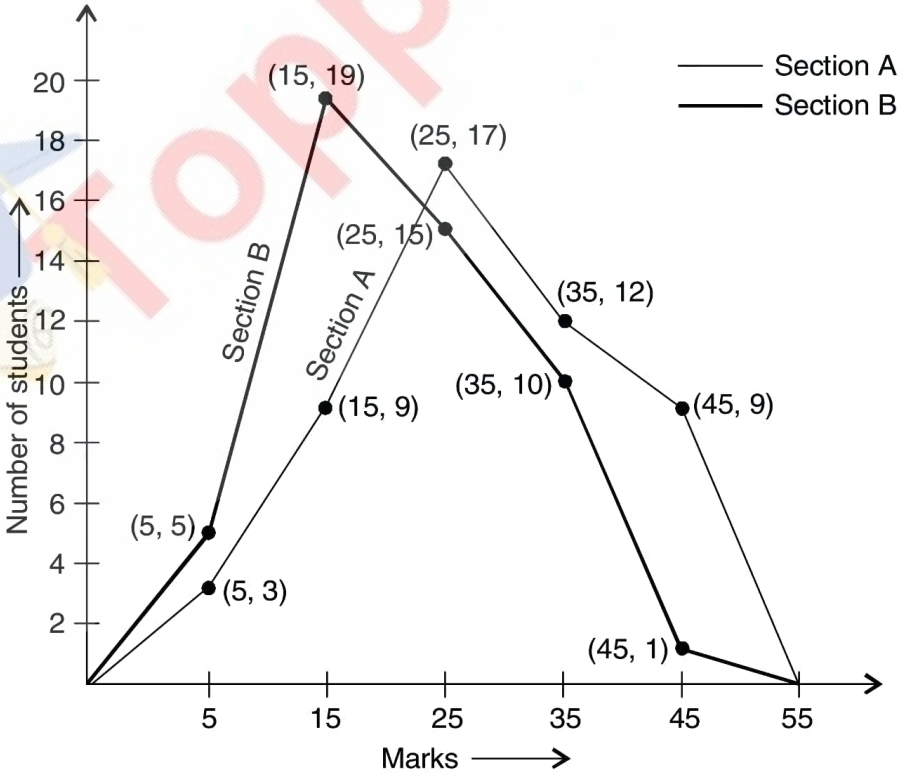
Section A		*Section B*	
Marks	*Frequency*	*Marks*	*Frequency*
0 - 10	*3*	*0 - 10*	*5*
10 - 20	*9*	*10 - 20*	*19*
20 - 30	*17*	*20 - 30*	*15*
30 - 40	*12*	*30 - 40*	*10*
40 - 50	*9*	*40 - 50*	*1*

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.

Sol.

Section A			Section B		
Marks	Class Marks	Frequency	Marks	Class Marks	Frequency
0 - 10	5	3	0 - 10	5	5
10 - 20	15	9	10 - 20	15	19
20 - 30	25	17	20 - 30	25	15
30 - 40	35	12	30 - 40	35	10
40 - 50	45	9	40 - 50	45	1

Frequency polygons, representing marks of students of both the sections.



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

Number of balls	*Team A*	*Team B*
1 - 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*

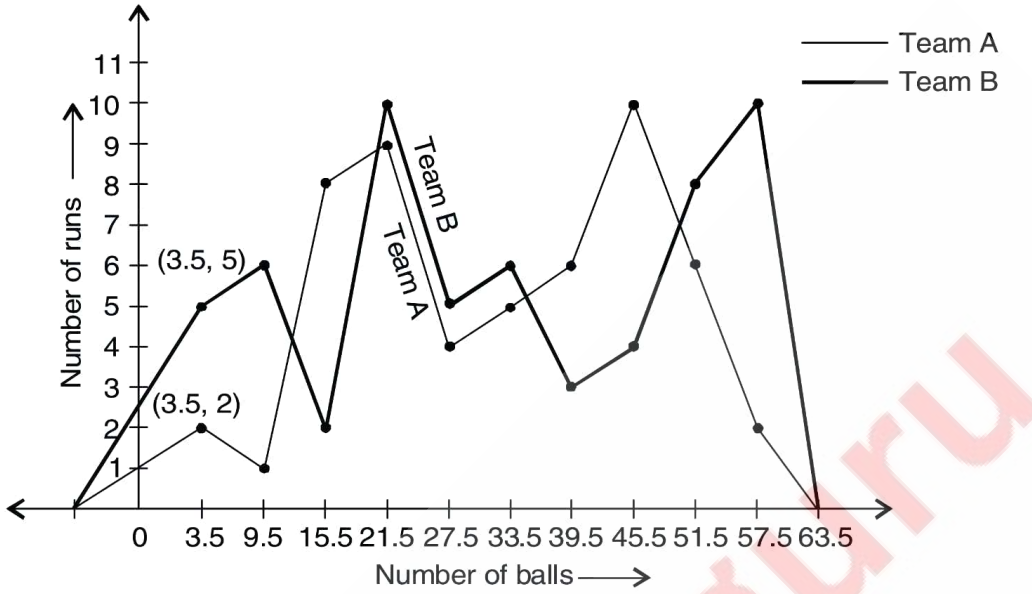
Represent the data of both the teams on the same graph by frequency polygons.

[**Hint.** *First make the class intervals continuous.*]

Sol. Let us represent the data into continuous class-intervals.

Number of balls	*Class Mark*	*Runs of Team A*	*Runs of Team B*
0.5 - 6.5 (1 - 6)	3.5	2	5
6.5 - 12.5 (7 - 12)	9.5	1	6
12.5 - 18.5 (13 - 18)	15.5	8	2
18.5 - 24.5 (19 - 24)	21.5	9	10
24.5 - 30.5 (25 - 30)	27.5	4	5
30.5 - 36.5 (31 - 36)	33.5	5	6
36.5 - 42.5 (37 - 42)	39.5	6	3
42.5 - 48.5 (43 - 48)	45.5	10	4
48.5 - 54.5 (49 - 54)	51.5	6	8
54.5 - 60.5 (55 - 60)	57.5	2	10

Frequency polygons representing the runs scored by two teams A and B on the first 60 balls are given below.



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

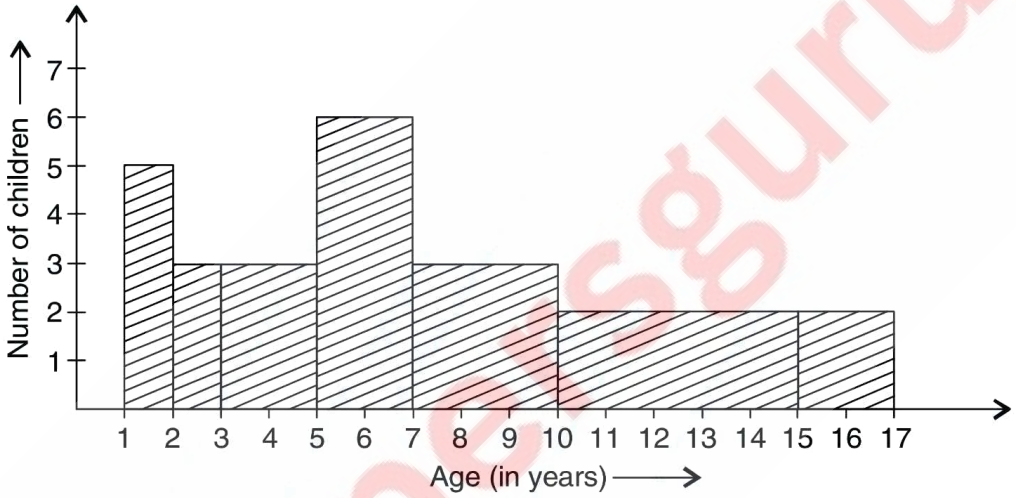
Age (in years)	*Number of children*
1 - 2	*5*
2 - 3	*3*
3 - 5	*6*
5 - 7	*12*
7 - 10	*9*
10 - 15	*10*
15 - 17	*4*

Draw a histogram to represent the data above.

Sol.

Age (in years)	Number of children	Class size	Length of the 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	$\frac{4}{2} \times 1 = 2$



9. *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*

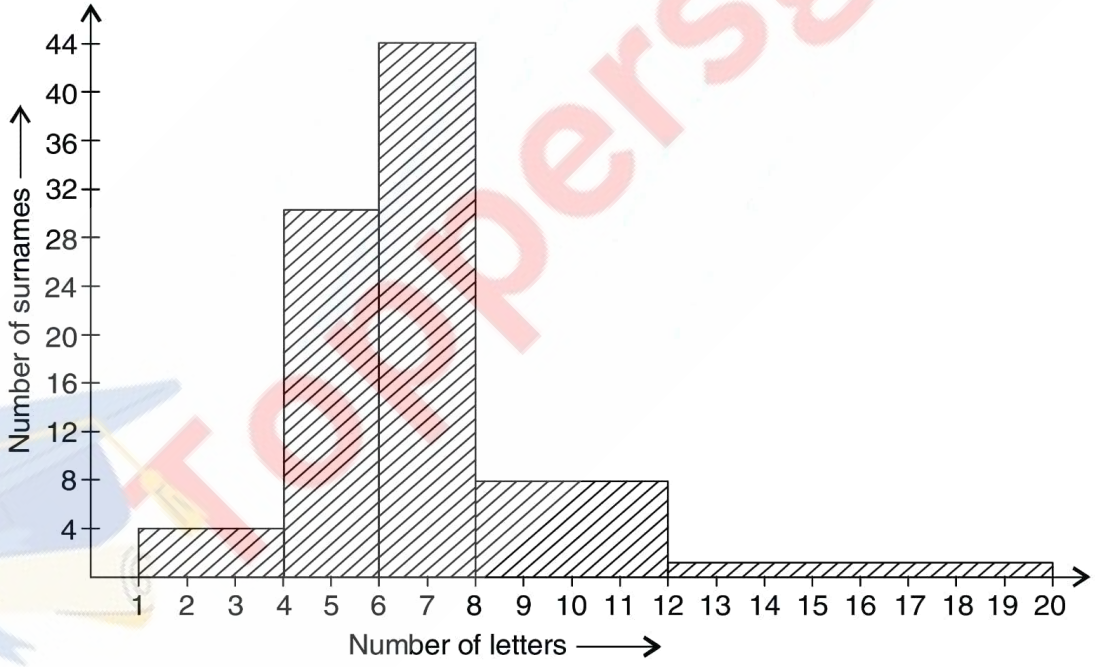
(*i*) *Draw a histogram to depict the given information.*

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

Sol.

Number of letters	Number of surnames	Class size	Length of the 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	$\frac{4}{8} \times 2 = 1$

(*i*) Histogram representing the number of letters in English alphabet in the surnames is given below.



(*ii*) Maximum number of surnames lies in the interval 6–8.