RS Aggarwal Solutions for Class 9 Maths Chapter 17 – Bar Graph, Histogram and Frequency Polygon

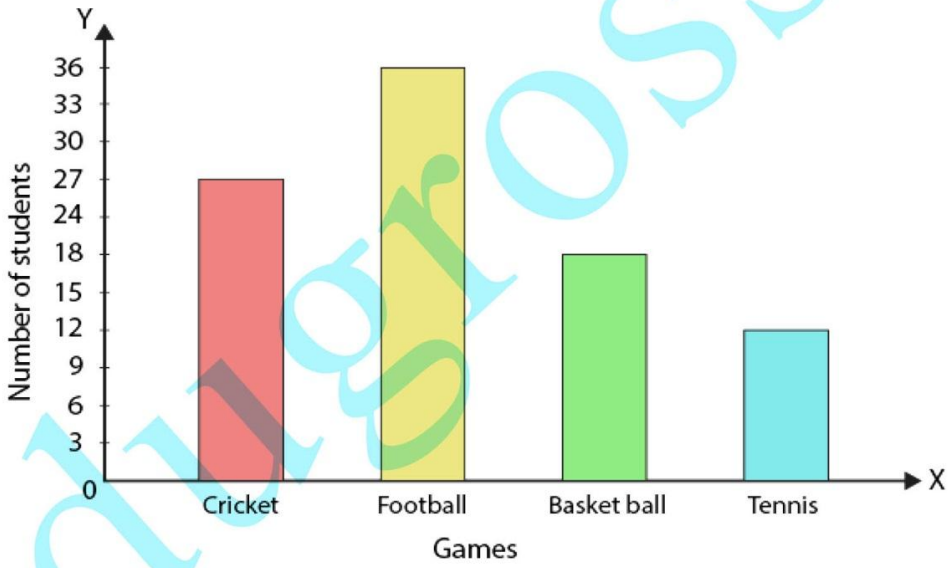
EXERCISE 17(A) PAGE: 642

1. The following table shows the number of students participating in various games in a school.

Game	Number of students
Cricket	27
Football	36
Basketball	18
Tennis	12

Draw a bar graph to represent the above data.
Solution:

Take games on the X axis and the number of students on Y axis.
Consider 1 small square = 3 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

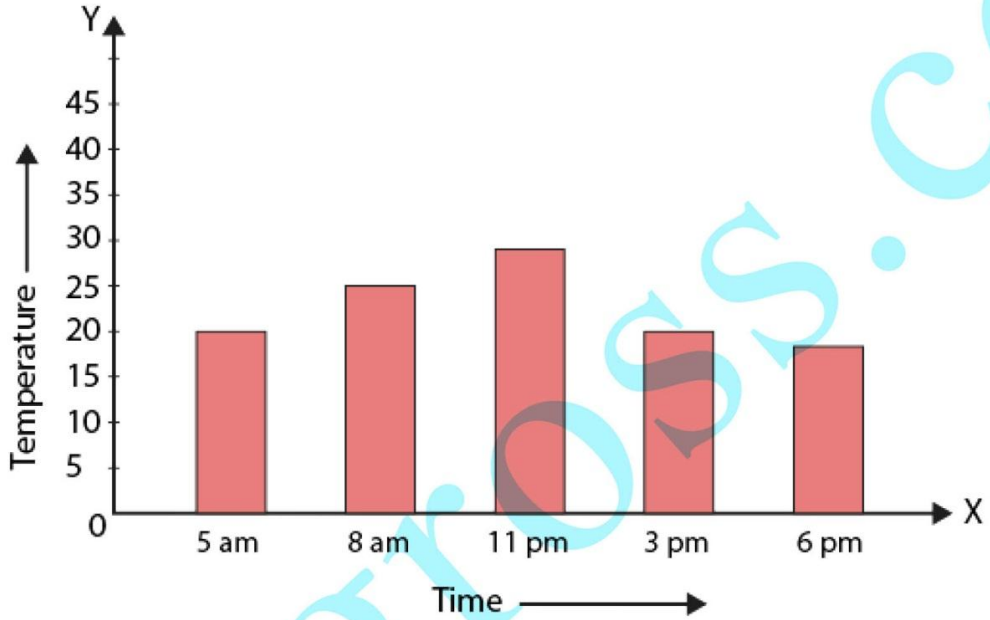


2. On a certain day, the temperature in a city was recorded as under:

Time	Temperature in °C
5 am	20
8 am	24
11 am	26
3 pm	22
6 pm	18

Illustrate the data by a bar graph.
Solution:

Take timings on the X axis and the temperatures on Y axis.
Consider 1 small square = 5 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

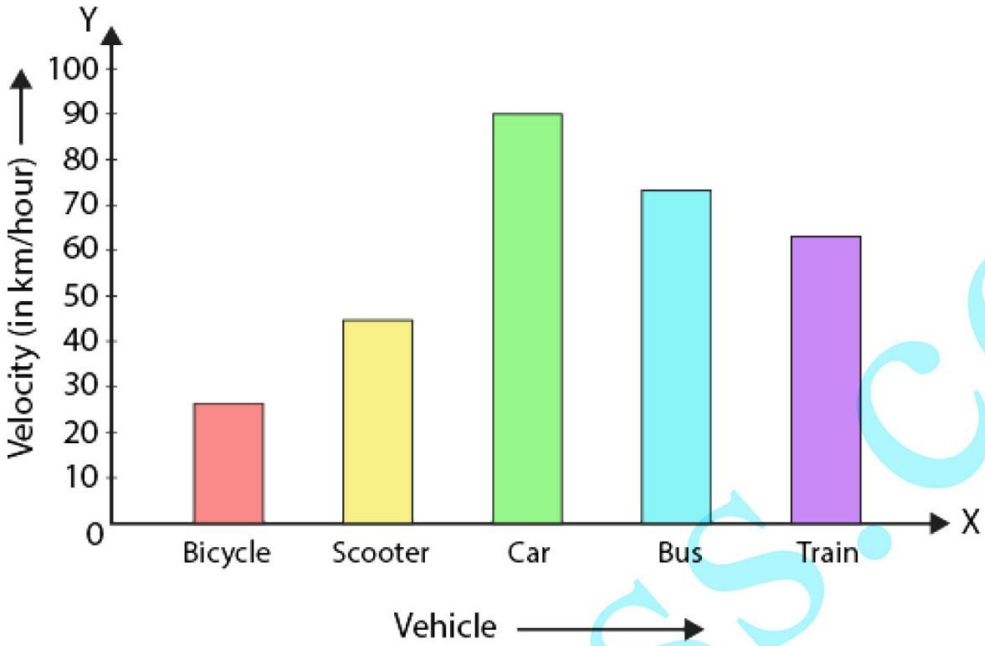


3. The approximate velocities of some vehicles are given below:

Name of vehicle	Velocity (in km/ hr)
Bicycle	27
Scooter	45
Car	90
Bus	72
Train	63

Draw a bar graph to represent the above data.
Solution:

Take vehicles on the X axis and the velocity on Y axis.
Consider 1 small square = 10 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

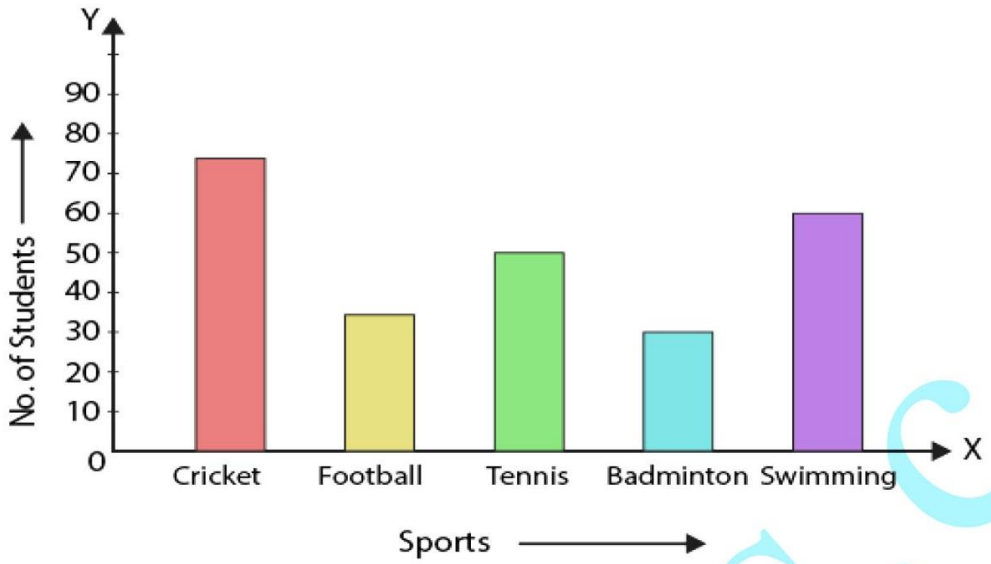


4. The following table shows the favourite sports of 250 students of a school. Represent the data by a bar graph.

Sports	Number of students
Cricket	75
Football	35
Tennis	50
Badminton	25
Swimming	65

Solution:

Take types of sports on the X axis and the number of students on Y axis.
Consider 1 small square = 10 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

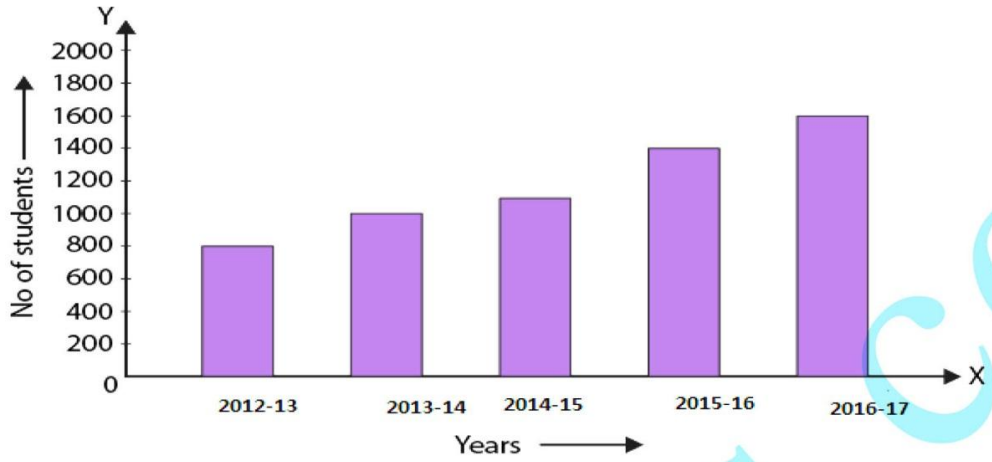


5. Given below is a table which shows the year wise strength of a school. Represent this data by a bar graph.

Year	Number of students
2012-13	800
2013-14	975
2014-15	1100
2015-16	1400
2016-17	1625

Solution:

Take year on the X axis and the number of students on Y axis.
Consider 1 big division = 200 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

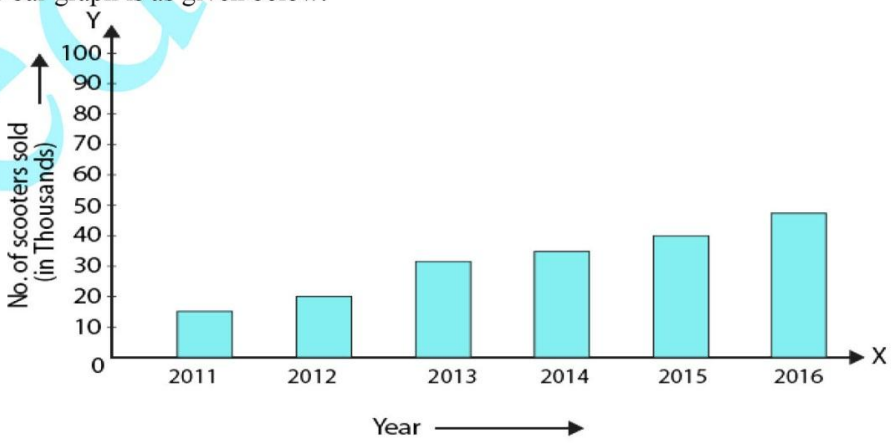


6. The following table shows the number of scooters sold by a dealer during six consecutive years. Draw a bar graph to represent this data.

Year	Number of scooters sold (in thousands)
2011	16
2012	20
2013	32
2014	36
2015	40
2016	48

Solution:

Take year on the X axis and the number of scooters sold on Y axis.
Consider 1 small square = 10 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

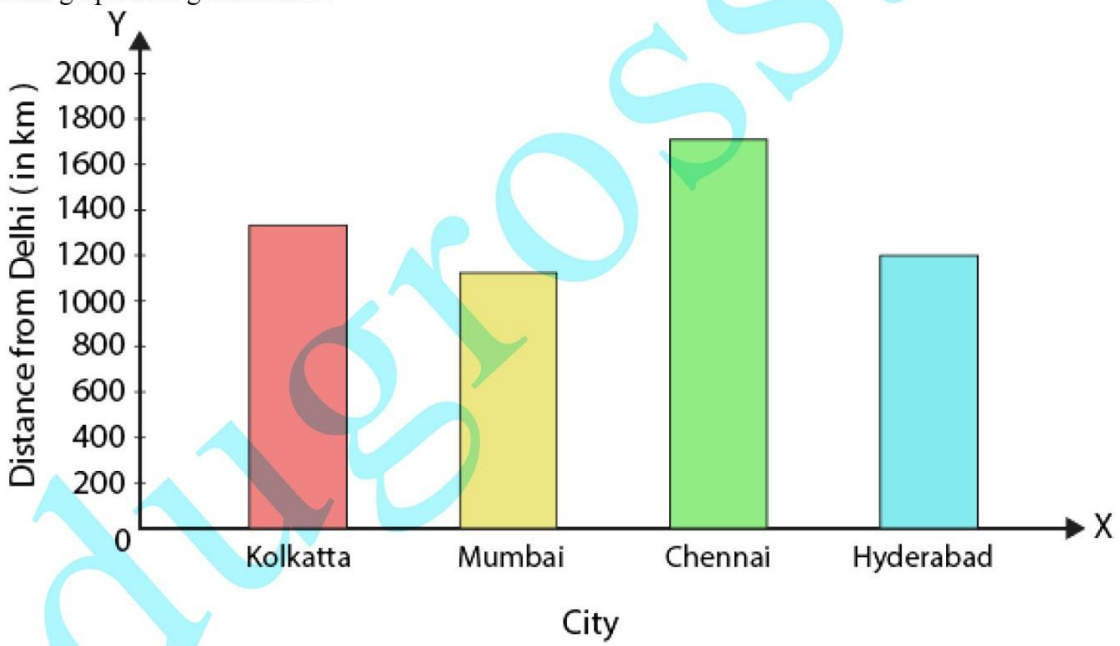


7. The air distances of four cities from Delhi (in km) are given below:

City	Distance from Delhi (in km)
Kolkata	1340
Mumbai	1100
Chennai	1700
Hyderabad	1220

Draw a bar graph to represent the above data.
Solution:

Take city on the X axis and the distance from Delhi on Y axis.
Consider 1 big division = 200 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

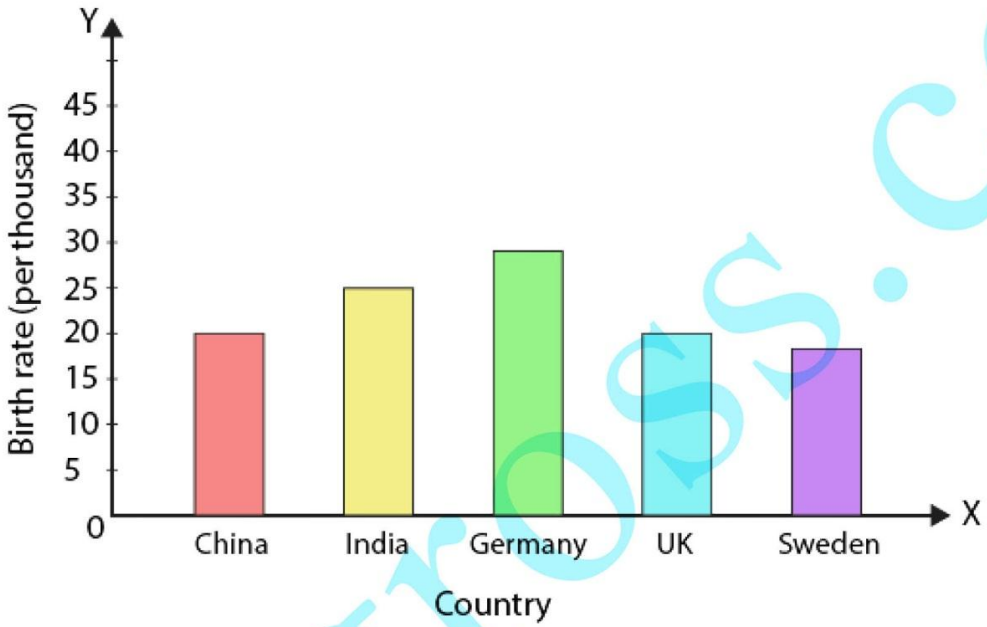


8. The birth rate per thousand in five countries over a period of time is shown below:

Country	Birth rate per thousand
China	42
India	35
Germany	14
UK	28
Sweden	21

Represent the above data by a bar graph.

Solution:
Take countries on the X axis and the birth rate on Y axis.
Consider 1 big division = 5 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

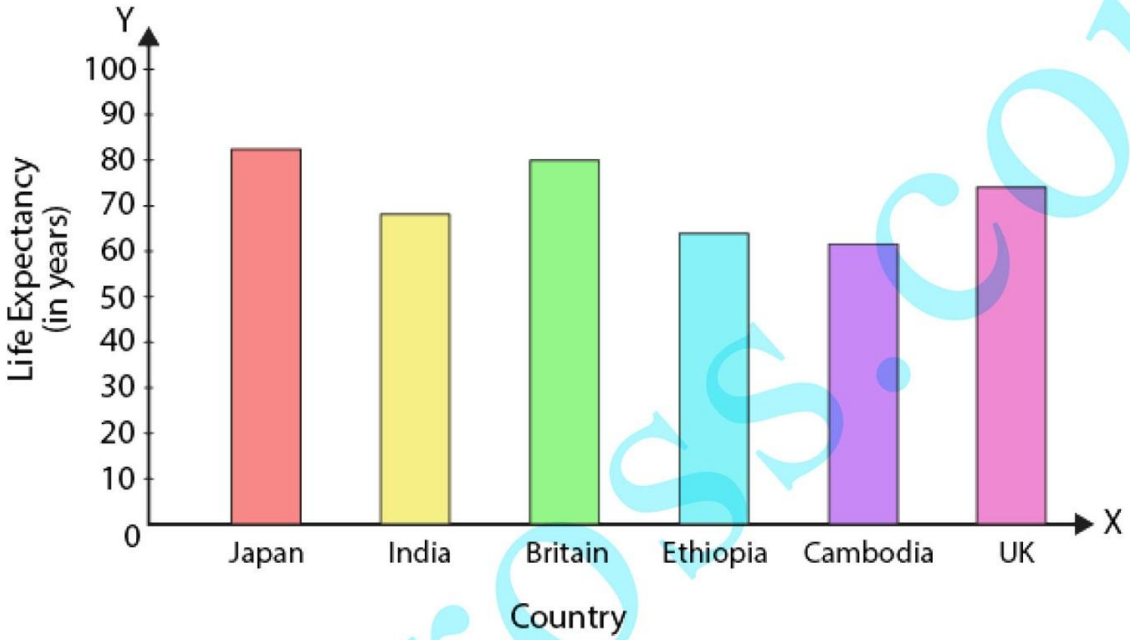


9. The following table shows the life expectancy (average age to which people live in various countries in a particular year. Represent the data by a bar graph.

Country	Life expectancy (in years)
Japan	84
India	68
Britain	80
Ethiopia	64
Cambodia	62
UK	73

Solution:

Take country on the X axis and the life expectancy on Y axis.
Consider 1 small square = 10 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

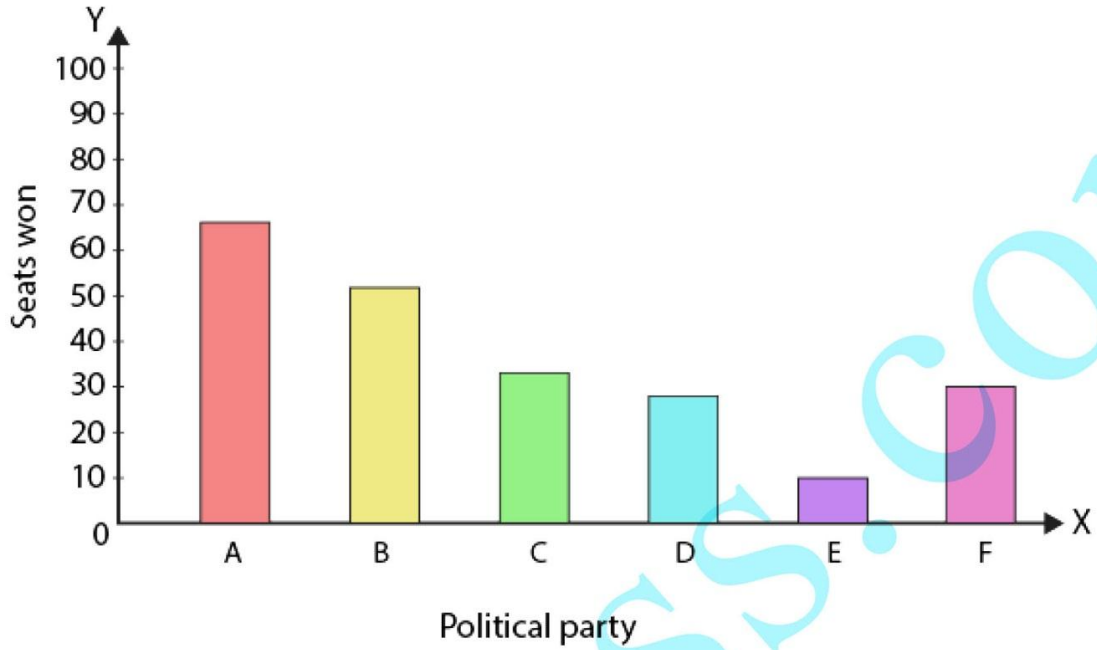


10. Given below are the seats won by different political parties in the polling outcome of a state assembly elections:

Political Party	Seats won
A	65
B	52
C	34
D	28
E	10
F	31

Draw a bar graph to represent the polling results.
Solution:

Take political party on the X axis and the seats won on Y axis.
Consider 1 small square = 10 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:

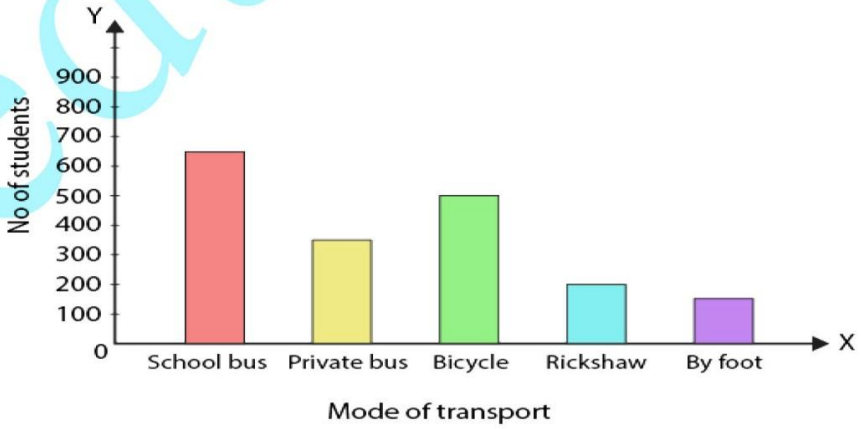


11. Various modes of transport used by 185 students of a school are given below:

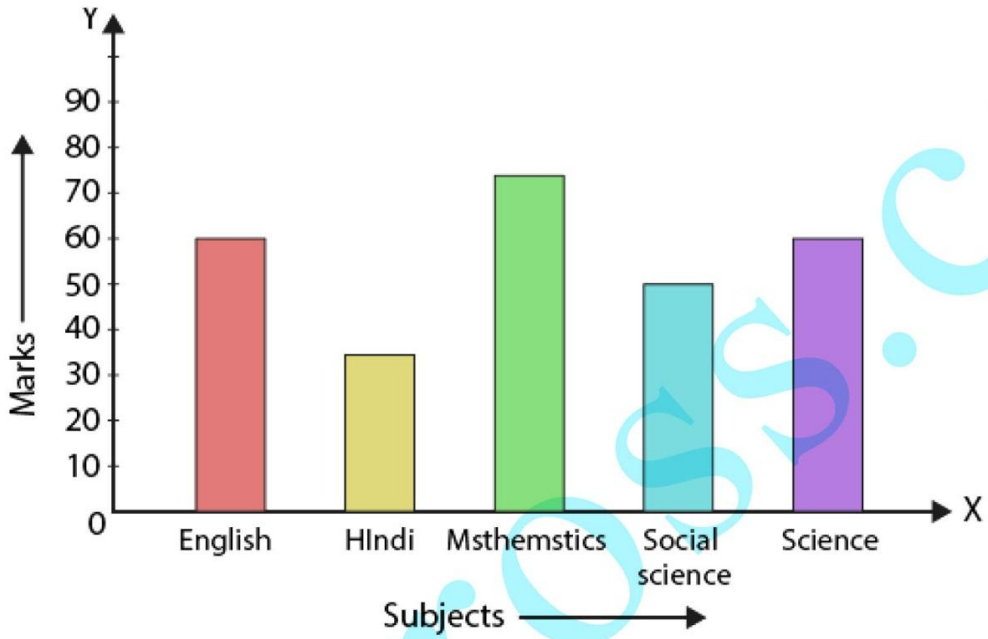
School bus	Private bus	Bicycle	Rickshaw	By foot
640	360	490	210	150

Draw a bar graph to represent the above data.
Solution:

Take mode of transport on the X axis and the number of students on Y axis.
Consider 1 big division = 100 units on the Y axis
The bars should be of same width and space should be sufficient between consecutive bars.
The bar graph is as given below:



12. Look at the bar graph given below:



Read it carefully and answer the following questions:
(i) What information does the bar graph give?
(ii) In which subject is the student very good?
(iii) In which subject is he poor?
(iv) What is the average of his marks?
Solution:

(i) The bar graph shows the marks obtained by a student in various subjects in an examination.

(ii) The student is very good in mathematics.

(iii) He is poor in Hindi.

(iv) Average marks = (60 + 35 + 75 + 50 + 60)/ 5 = 280/5 = 56.

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EXERCISE 17(B) PAGE: 658

1. The daily wages of 50 workers in a factory are given below:

Daily wages (in ₹)	Number of workers
340 - 380	16
380 - 420	9
420 - 460	12
460 - 500	2
500 - 540	7
540 - 580	4

Construct a histogram to represent the above frequency distribution.
Solution:

The frequency distribution is as follows:

Daily wages (in ₹)	Number of workers
340 - 380	16
380 - 420	9
420 - 460	12
460 - 500	2
500 - 540	7
540 - 580	4

We know that of the upper limit of one class is the lower limit of next class then exclusive method of classification is necessary. So the frequency distribution is in the exclusive form.
Consider the class intervals that is Daily wages (in ₹) on the X – axis and number of workers on the Y- axis and draw rectangles which provides the required histogram.
A break is indicated near the origin on the X axis since the scale starts at 340.

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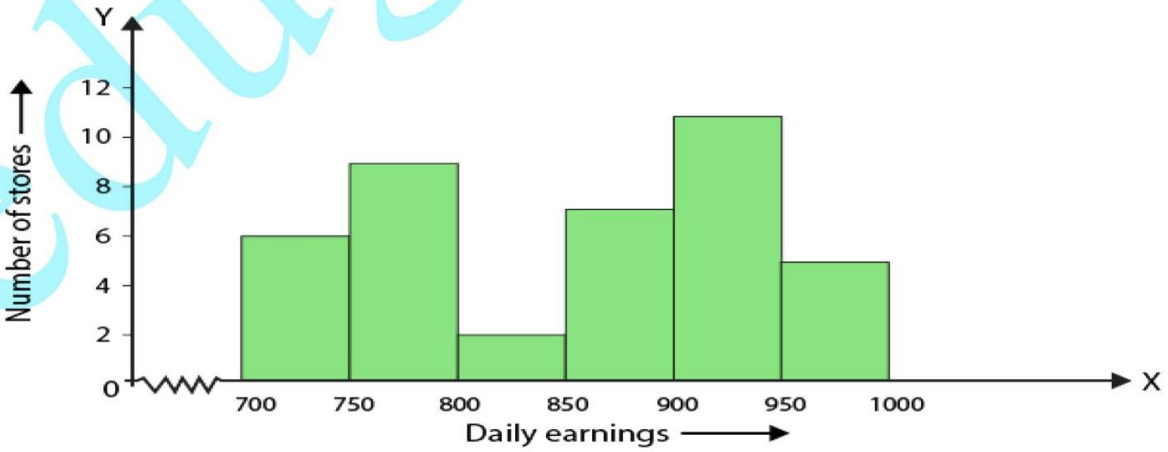
2. The following table shows the average daily earnings of 40 general stores in a market, during a certain week:

Daily earning (in rupees)	Number of stores
700 - 750	6
750 - 800	9
800 - 850	2
850 - 900	7
900 - 950	11
950 - 1000	5

Draw a histogram to represent the above data.
Solution:
The frequency distribution is as follows:

Daily earning (in rupees)	Number of stores
700 - 750	6
750 - 800	9
800 - 850	2
850 - 900	7
900 - 950	11
950 - 1000	5

We know that of the upper limit of one class is the lower limit of next class then exclusive method of classification is necessary. So the frequency distribution is in the exclusive form.
Consider the class intervals that is Daily earning in rupees on the X – axis and number of stores on the Y- axis and draw rectangles which provides the required histogram.
A break is indicated near the origin on the X axis since the scale starts at 700.



3. The heights of 75 students in a school are given below:

Height (in cm)	Number of students

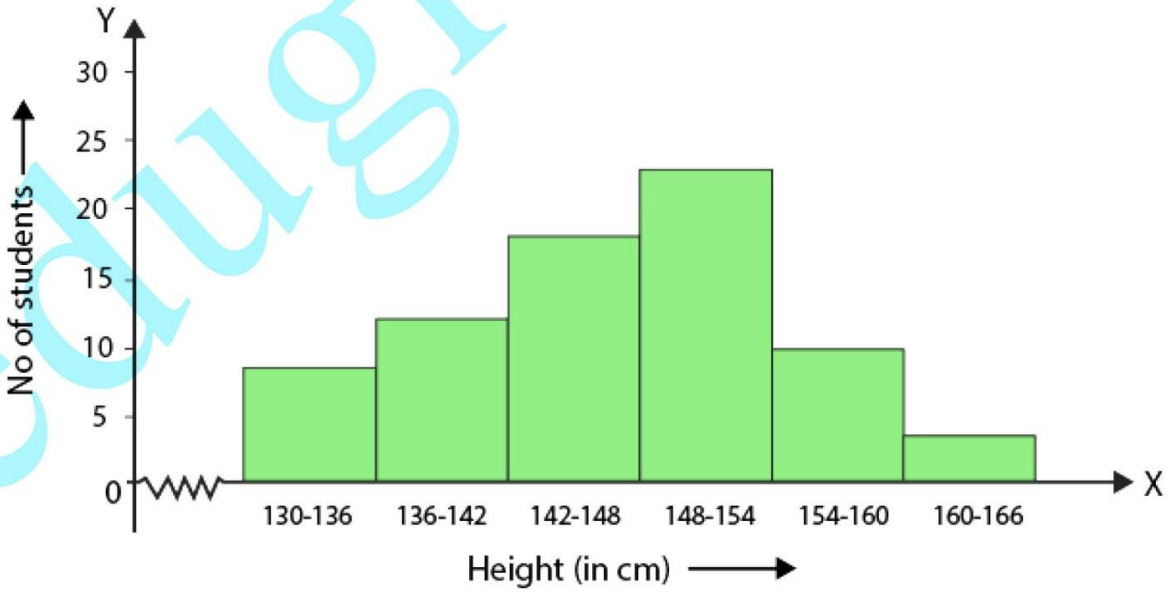
130 - 136	**9**
136 - 142	**12**
142 - 148	**18**
148 - 154	**23**
154 - 160	**10**
160 - 166	**3**

Draw a histogram to represent the above data.
Solution:

The frequency distribution is as follows:

Height (in cm)	Number of students
130 - 136	9
136 - 142	12
142 - 148	18
148 - 154	23
154 - 160	10
160 - 166	3

We know that of the upper limit of one class is the lower limit of next class then exclusive method of classification is necessary. So the frequency distribution is in the exclusive form.
Consider the class intervals that is height in cm on the X – axis and number of students on the Y- axis and draw rectangles which provides the required histogram.
A break is indicated near the origin on the X axis since the scale starts at 130.

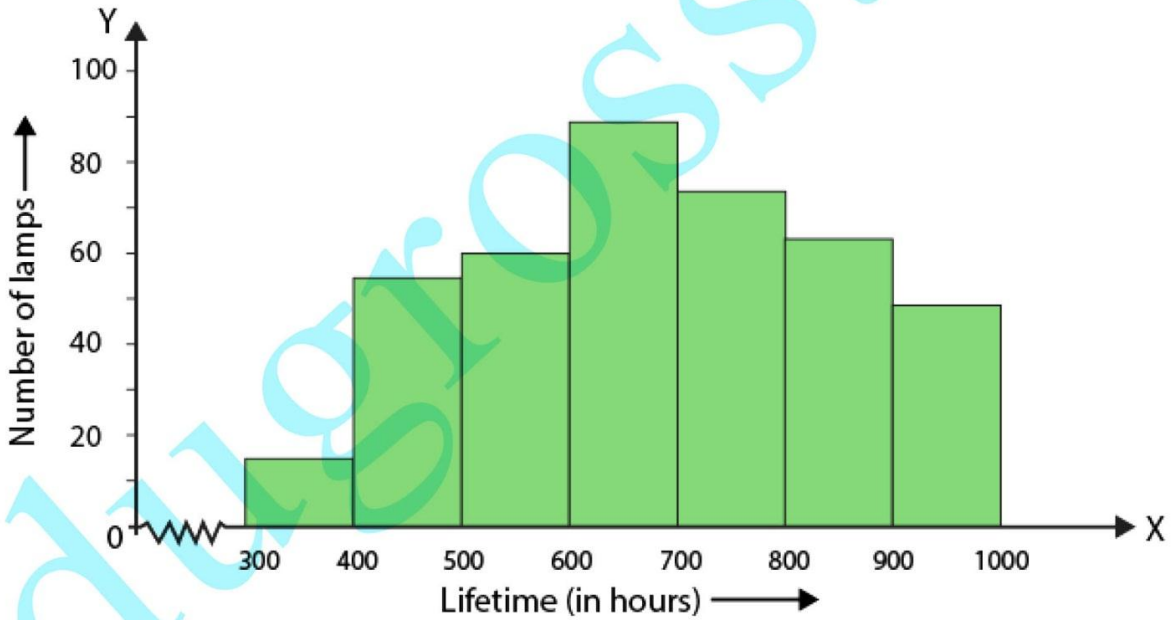


4. The following table gives the lifetimes of 400 neon lamps:

Lifetime (in hr)	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 lifetime of more than 700 hours?
Solution:

(i) Histogram is given below:



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

5. Draw a histogram for the frequency distribution of the following data:

Class interval	Frequency
8 - 13	320
13 - 18	780
18 - 23	160
23 - 28	540
28 - 33	260
33 - 38	100
38 - 43	80

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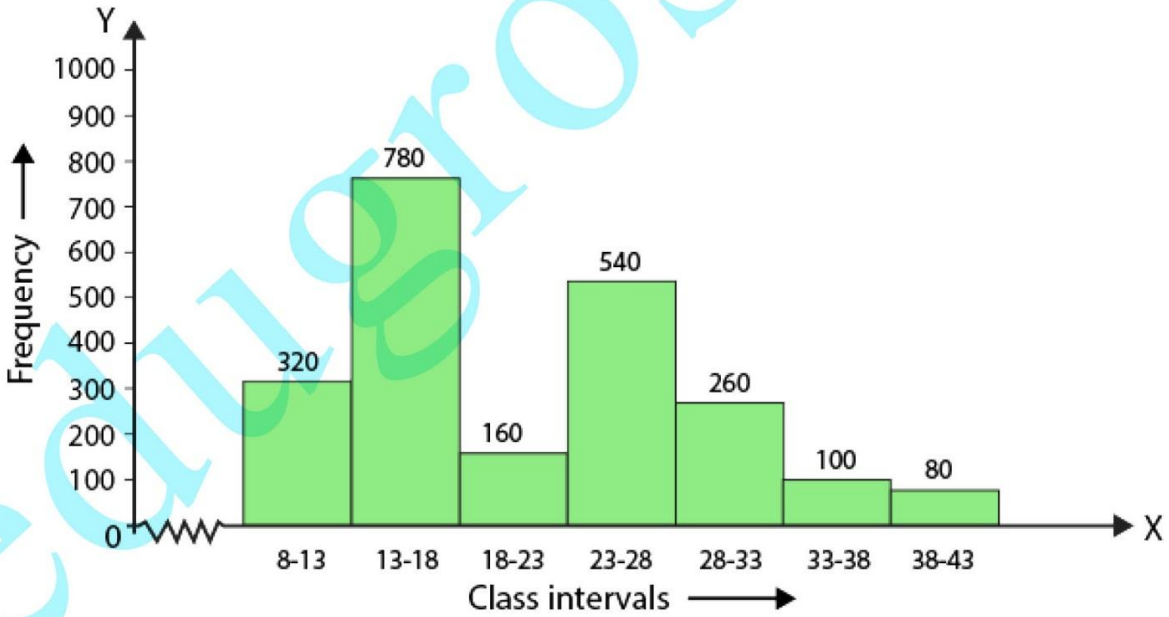
Solution:

The frequency distribution is as follows:

Class interval	Frequency
8 - 13	320
13 - 18	780
18 - 23	160
23 - 28	540
28 - 33	260
33 - 38	100
38 - 43	80

We know that of the upper limit of one class is the lower limit of next class then exclusive method of classification is necessary. So the frequency distribution is in the exclusive form.
Consider the class intervals on the X – axis and frequency on the Y- axis and draw rectangles which provides the required histogram.
A break is indicated near the origin on the X axis since the scale starts at 8.



6. Construct a histogram for the following frequency distribution:

Class interval	Frequency
5 - 12	6
13 - 20	15
21 - 28	24
29 - 36	18

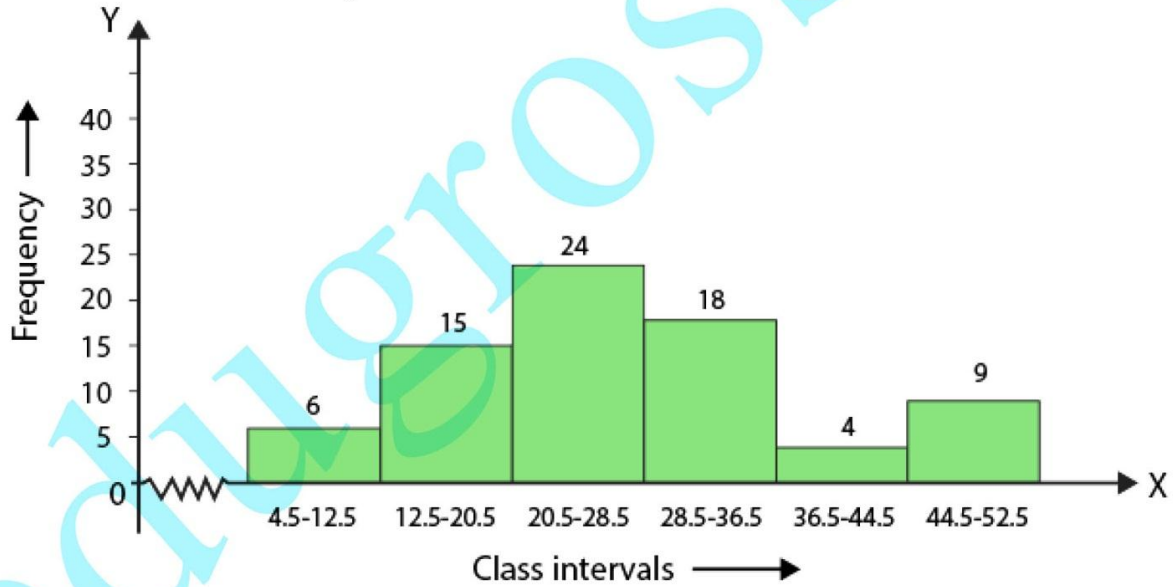
37 - 44	**4**
45 - 52	**9**

Solution:

Convert the given inclusive form into an exclusive form by taking intervals as given below:

Class interval	Frequency
4.5 – 12.5	6
12.5 – 20.5	15
20.5 – 28.5	24
28.5 – 36.5	18
36.5 – 44.5	4
454.5 – 52.5	9

Consider the class intervals on the X – axis and frequency on the Y- axis and draw rectangles which provides the required histogram.
A break is indicated near the origin on the X axis since the scale starts at 4.5.



7. The following table shows the number of illiterate persons in the age group (10 – 58 years) in a town:

Age group (in years)	Number of illiterate persons
10 - 16	**175**
17 - 23	**325**
24 - 30	**100**
31 - 27	**150**
38 - 44	**250**
45 - 51	**400**

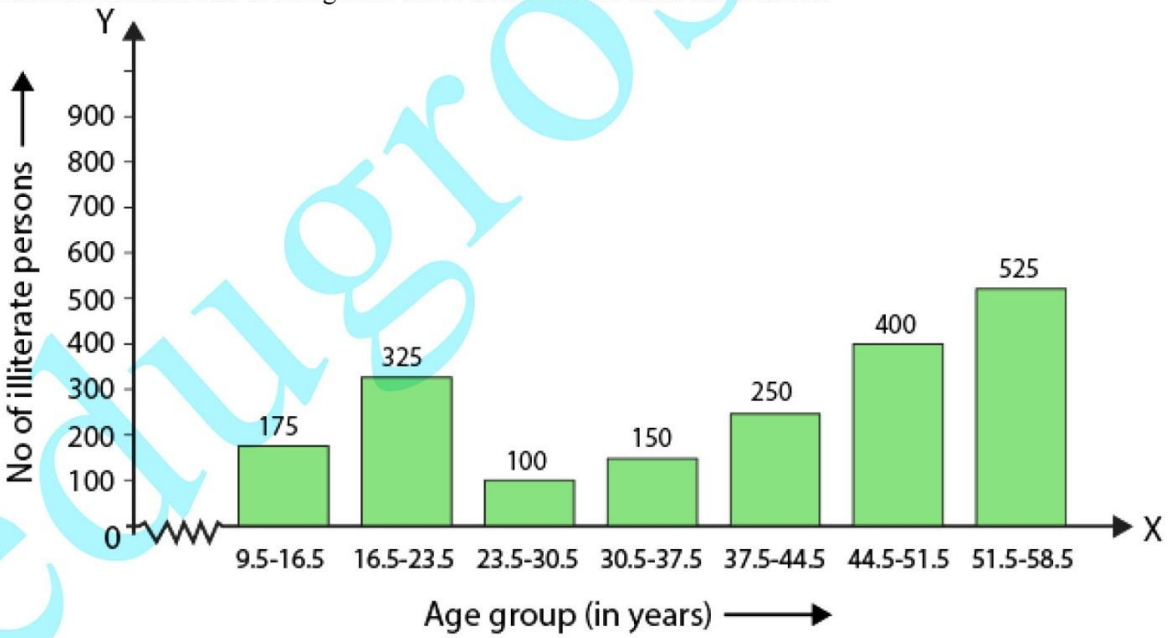
52 - 58	525

Draw a histogram to represent the above data.
Solution:

Convert the given inclusive form into an exclusive form by taking intervals as given below:

Age group (in years)	Number of illiterate persons
9.5 – 16.5	175
16.5 – 23.5	325
23.5 – 30.5	100
30.5 – 37.5	150
37.5 – 44.5	250
44.5 – 51.5	400
51.5 – 58.5	525

Consider the class intervals that is age group in years on the X – axis and number of illiterate persons on the Y-axis and draw rectangles which provides the required histogram.
A break is indicated near the origin on the X axis since the scale starts at 9.5.



8. Draw a histogram to represent the following data:

Class interval	Frequency
10 - 14	5
14 - 20	6
20 - 32	9

32 - 52	**25**
52 - 80	**21**

Solution:

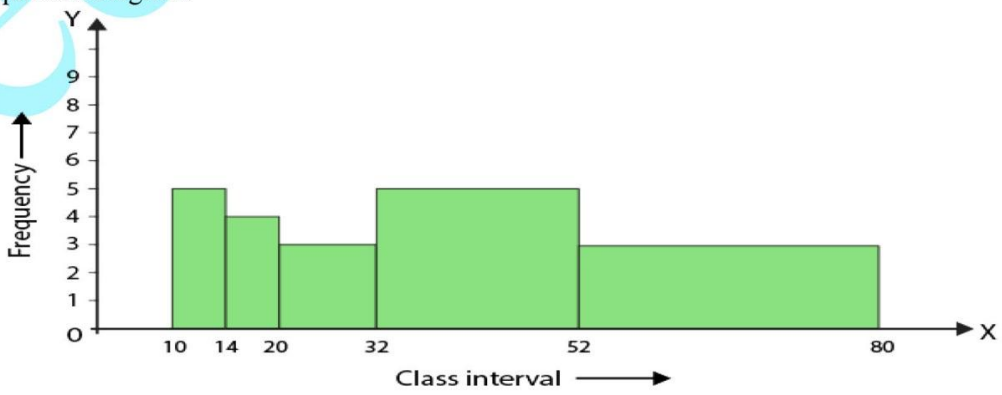
The frequency distribution is as follows:

Class interval	Frequency
10 - 14	5
14 - 20	6
20 - 32	9
32 - 52	25
52 - 80	21

The class sizes are 4, 6, 12, 20 and 28
So the minimum class size is 4
We know that
Adjusted frequency = (minimum class size × its frequency)/ class size of this class
On further calculation we get
4/4 × 5 = 5
4/6 × 6 = 4
4/12 × 9 = 3
4/20 × 25 = 5
4/28 × 21 = 3
So the adjusted frequency table is given below:

Class interval	Frequency
10 - 14	5
14 - 20	4
20 - 32	3
32 - 52	5
52 - 80	3

Consider the class intervals on the X – axis and frequency on the Y- axis and draw rectangles which provides the required histogram.



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9. 100 surnames were randomly picked up from a local telephone directory and 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.
Solution:

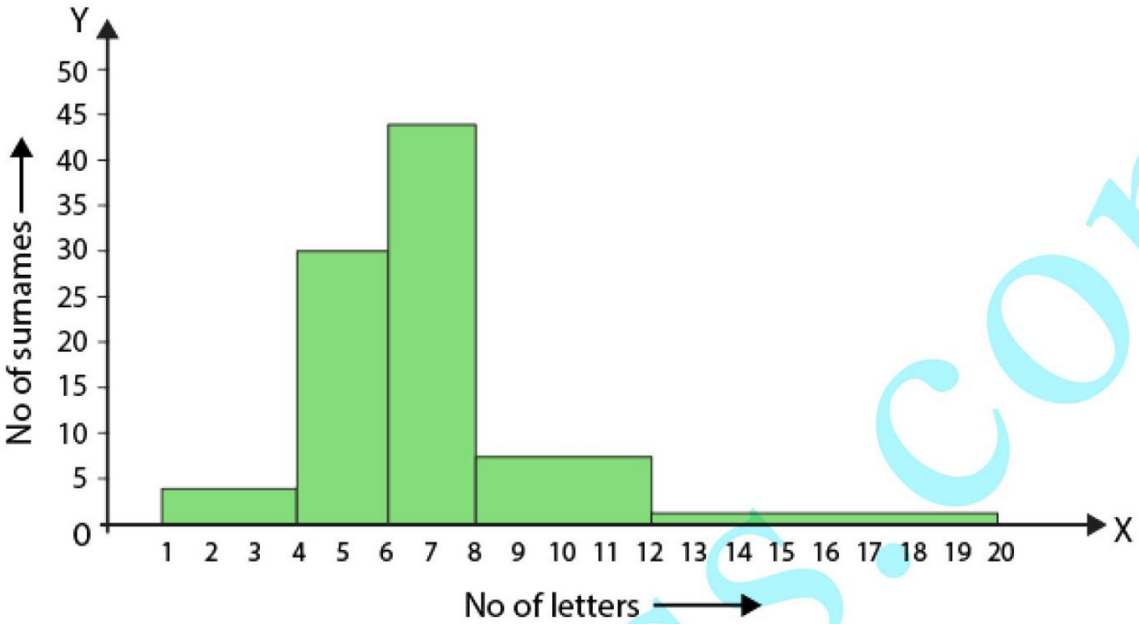
(i) The frequency distribution is as follows:

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

The class sizes are 3, 2, 2, 4 and 8
So the minimum class size is 2
We know that
Adjusted frequency = (minimum class size × its frequency)/ class size of this class
On further calculation we get
2/3 × 6 = 4
2/2 × 30 = 30
2/2 × 44 = 44
2/4 × 16 = 8
2/8 × 4 = 1
So the adjusted frequency table is given below:

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

Consider the class intervals that is number of letters on the X – axis and number of surnames on the Y- axis and draw rectangles which provides the required histogram.



(ii) Maximum surnames lie in class interval 6 – 8.

10. Draw a histogram to represent the following information:

Class interval	Frequency
5 – 10	**6**
10 – 15	**12**
15 - 25	**10**
25 - 45	**8**
45 - 75	**18**

Solution:

The frequency distribution is as follows:

Class interval	Frequency
5 – 10	6
10 – 15	12
15 - 25	10
25 - 45	8
45 - 75	18

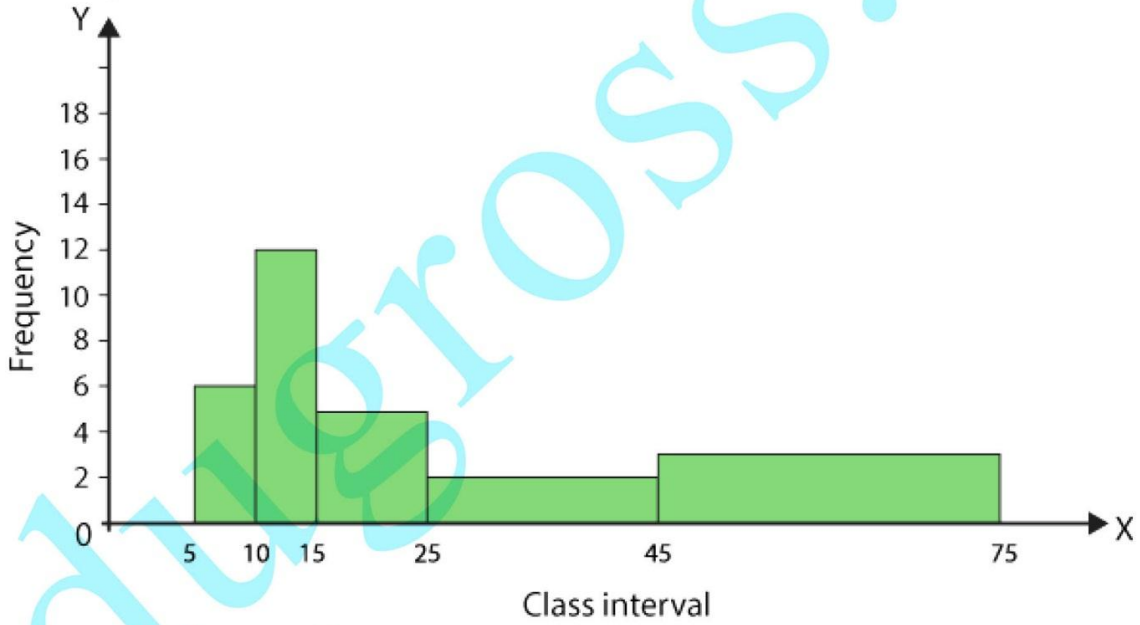
The class sizes are 5, 5, 10, 2 and 30
So the minimum class size is 5
We know that
Adjusted frequency = (minimum class size × its frequency)/ class size of this class
On further calculation we get
5/5 × 6 = 6

5/5 × 12 = 12
5/10 × 10 = 5
5/20 × 8 = 2
5/30 × 18 = 3

So the adjusted frequency table is given below:

Class interval	Frequency
5 – 10	6
10 – 15	12
15 - 25	5
25 - 45	2
45 - 75	3

Consider the class intervals on the X – axis and frequency on the Y- axis and draw rectangles which provides the required histogram.



11. Draw a histogram to represent the following information:

Marks	Number of students
0 - 10	8
10 - 30	32
30 - 45	18
45 - 50	10
50 - 60	6

Solution:

The frequency distribution is as follows:

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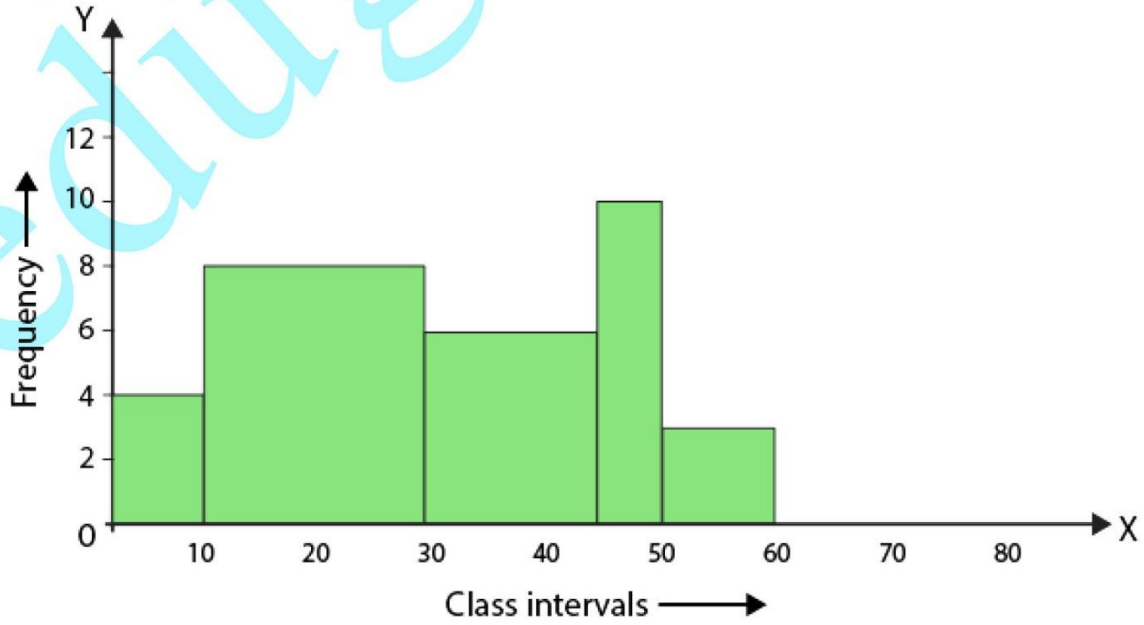
Marks	Number of students
0 - 10	8
10 - 30	32
30 - 45	18
45 - 50	10
50 - 60	6

The class sizes are 10, 20, 15, 5 and 10.
So the minimum class size is 5
We know that
Adjusted frequency = (minimum class size × its frequency)/ class size of this class
On further calculation we get
5/10 × 8 = 4
5/20 × 32 = 8
5/15 × 18 = 6
5/5 × 10 = 10
5/10 × 6 = 3
So the adjusted frequency table is given below:

Marks	Number of students
0 - 10	4
10 - 30	8
30 - 45	6
45 - 50	10
50 - 60	3

Consider the class intervals that is marks on the X – axis and number of students on the Y- axis and draw rectangles which provides the required histogram.



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12. In a study of diabetic patients in a village, the following observations were noted.

Age in years	Number of patients
10 - 20	2
20 - 30	5
30 - 40	12
40 - 50	19
50 - 60	9
60 - 70	4

Represent the above data by a frequency polygon.
Solution:

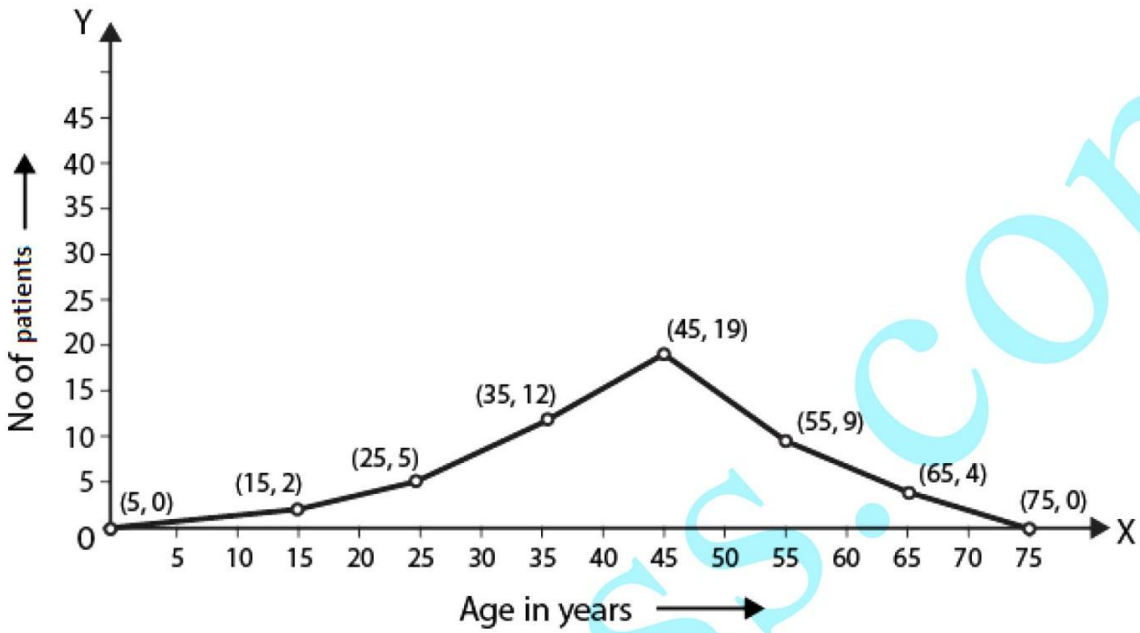
The frequency distribution is as follows:

Age in years	Number of patients
10 - 20	2
20 - 30	5
30 - 40	12
40 - 50	19
50 - 60	9
60 - 70	4

We know that
Class mark of a class interval = (lower limit + upper limit)/ 2

Age in years	Class marks	Frequency
0 - 10	5	0
10 - 2	15	2
20 - 30	25	5
30 - 40	35	12
40 - 50	45	19
50 - 60	55	9
60 - 70	65	4
70 - 80	75	0

By taking imaginary class intervals 0 – 10 and 70 – 80 with frequency 0 plot the points by taking class marks on X-axis and frequencies on the Y-axis.



13. Draw a frequency polygon for the following frequency distribution:

Class interval	Frequency
1 – 10	**8**
11 – 20	**3**
21 – 30	**6**
31 - 40	**12**
41 - 50	**2**
51 - 60	**7**

Solution:

The frequency distribution is as follows:

Class interval	Frequency
1 – 10	8
11 – 20	3
21 – 30	6
31 - 40	12
41 - 50	2
51 - 60	7

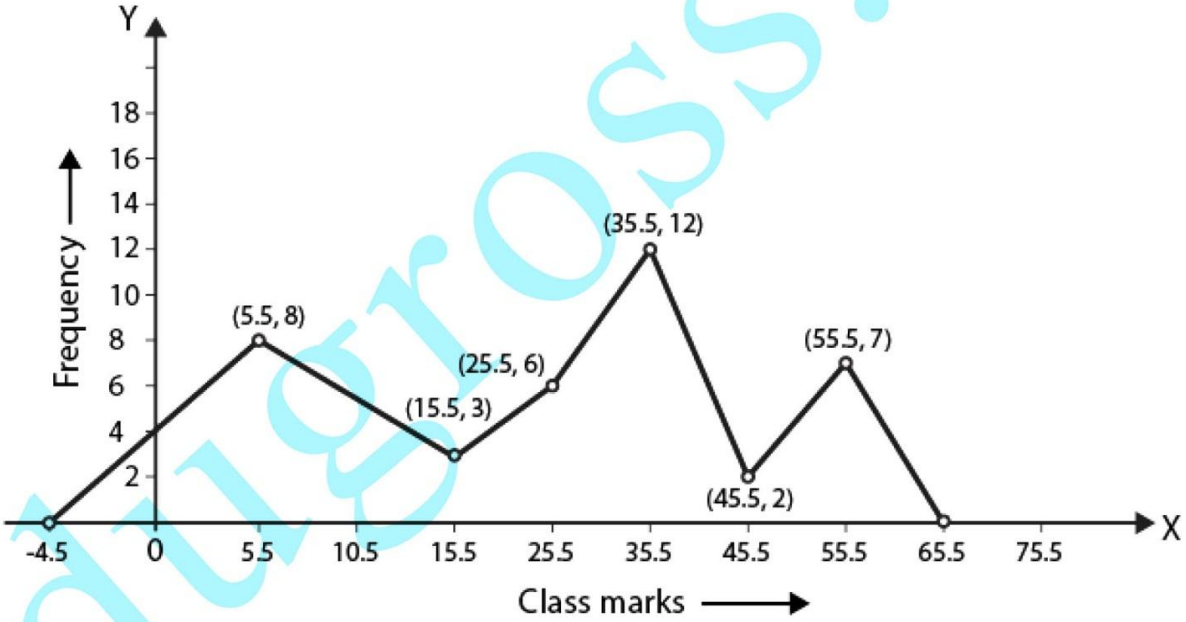
Convert the given inclusive form into an exclusive form by taking intervals as 0.5 – 1.5, 10.5 – 20.5, 20.5 – 30.5, 40.5 – 40.5, 40.5 – 50.5 and 50.5 – 60.5
We know that
Class mark of a class interval = (lower limit + upper limit)/ 2

RS Aggarwal Solutions for Class 9 Maths Chapter 17 – Bar Graph, Histogram and Frequency Polygon

Consider – 9.5 - 0.5 and 60.5 – 70.5 with frequency zero the table is as follows:

Class interval	True class intervals	Class marks	Frequency
(-9) - 0	(-9.5) - 0.5	-4.5	0
1 – 10	0.5 - 10.5	5.5	8
11 – 20	10.5 - 20.5	15.5	3
21 – 30	20.5 - 30.5	25.5	6
31 - 40	30.5 - 40.5	35.5	12
41 - 50	40.5 - 50.5	45.4	2
51 - 60	50.5 - 60.5	55.5	7
61 - 70	60.5 - 70.5	65.5	0

Consider the class intervals that is marks on the X – axis and frequency on the Y- axis.
Plot the points and join them to obtain the frequency polygon.



14. The age (in years) of 360 patients treated in a hospital on a particular day are given below:

Age in years	Number of patients
10 - 20	90
20 - 30	40
30 - 40	60
40 - 50	20
50 - 60	120
60 - 70	30

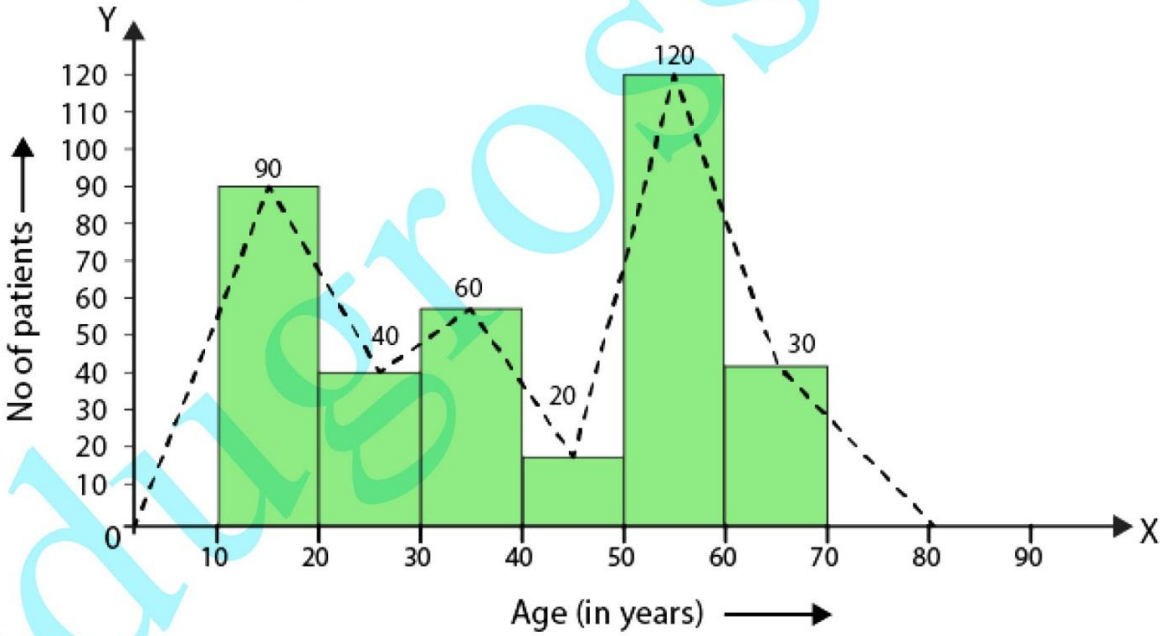
Draw a histogram and frequency polygon on the same graph to represent the above data.
Solution:

The frequency distribution is as follows:

Age in years	Number of patients
10 - 20	90
20 - 30	40
30 - 40	60
40 - 50	20
50 - 60	120
60 - 70	30

Consider the class intervals that is age in years on the X – axis and number of patients on the Y- axis and draw rectangles which provides the required histogram.
To construct a frequency polygon, take 0 – 10 and 70 – 80 as imaginary class intervals having class marks 5 and 75 with frequency zero and join the midpoints of rectangles i.e. A (5, 0) and B (75, 0).

So the frequency polygon is as given below:



15. Draw a histogram and the frequency polygon from the following data:

Class interval	Frequency
20 - 25	30
25 - 30	24
30 - 35	52
35 - 40	28
40 - 45	46
45 - 50	10

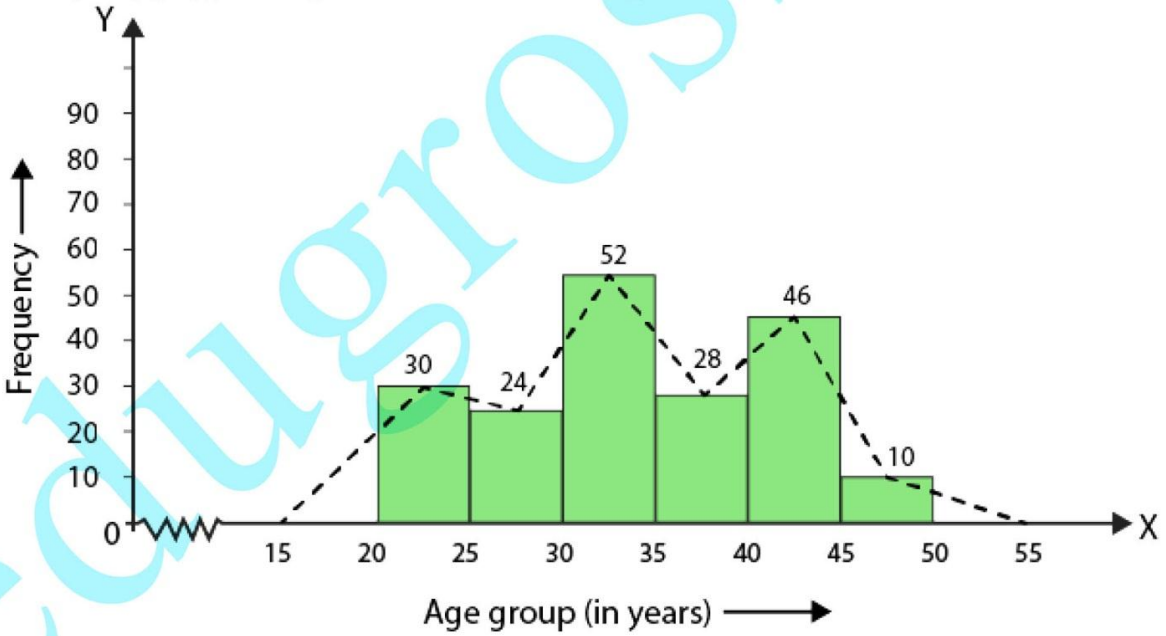
Solution:

The frequency distribution is as follows:

Class interval	Frequency
20 - 25	30
25 - 30	24
30 - 35	52
35 - 40	28
40 - 45	46
45 - 50	10

Consider the class intervals on the X – axis and frequency on the Y- axis and draw rectangles which provides the required histogram.
To construct a frequency polygon, take 15 - 20 and 50 – 55 as imaginary class intervals with frequency zero and join the midpoints of rectangles.

So the frequency polygon is as given below:



16. Draw a histogram for the following data:

Class interval	Frequency
600 - 640	18
640 - 680	45
680 - 720	153
720 - 760	288

760 - 800	**171**
800 - 840	**63**

Using this histogram, draw the frequency polygon on the same graph.
Solution:

The frequency distribution is as follows:

Class interval	Frequency
600 - 640	18
640 - 680	45
680 - 720	153
720 - 760	288
760 - 800	171
800 - 840	63

Consider the class intervals on the X – axis and frequency on the Y- axis and draw rectangles which provides the required histogram.
To construct a frequency polygon, take 560 - 600 and 840 – 880 as imaginary class intervals with frequency zero and join the midpoints of rectangles.

So the frequency polygon is as given below: