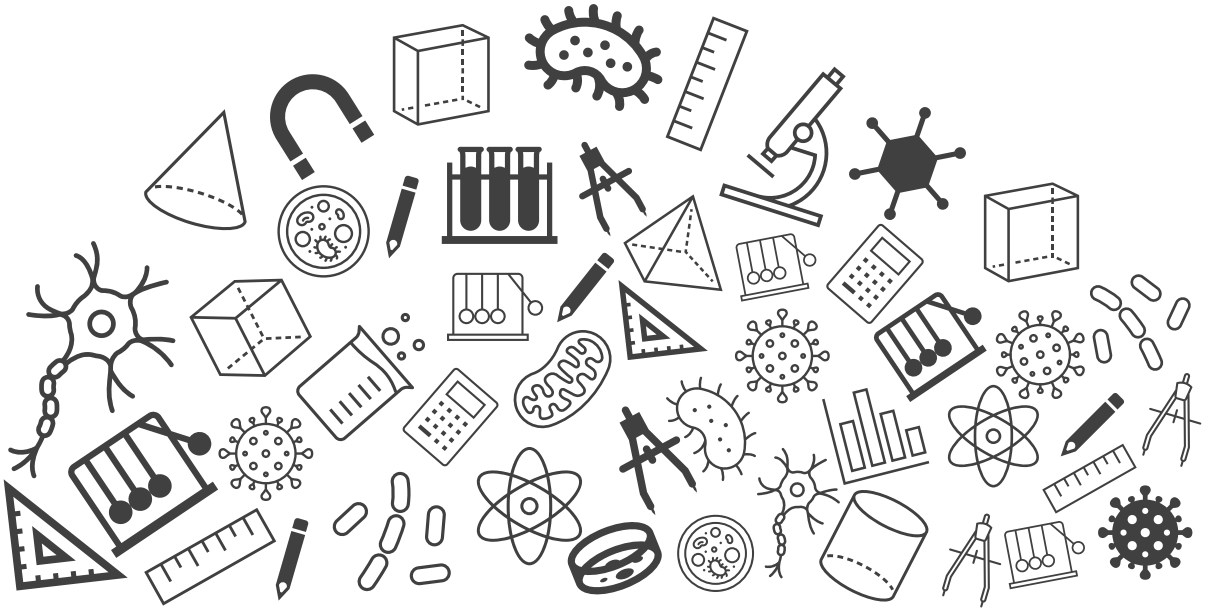
# Grade 09: Maths
# Exam Important Questions



Topic : Exam Important Questions

1. 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 |

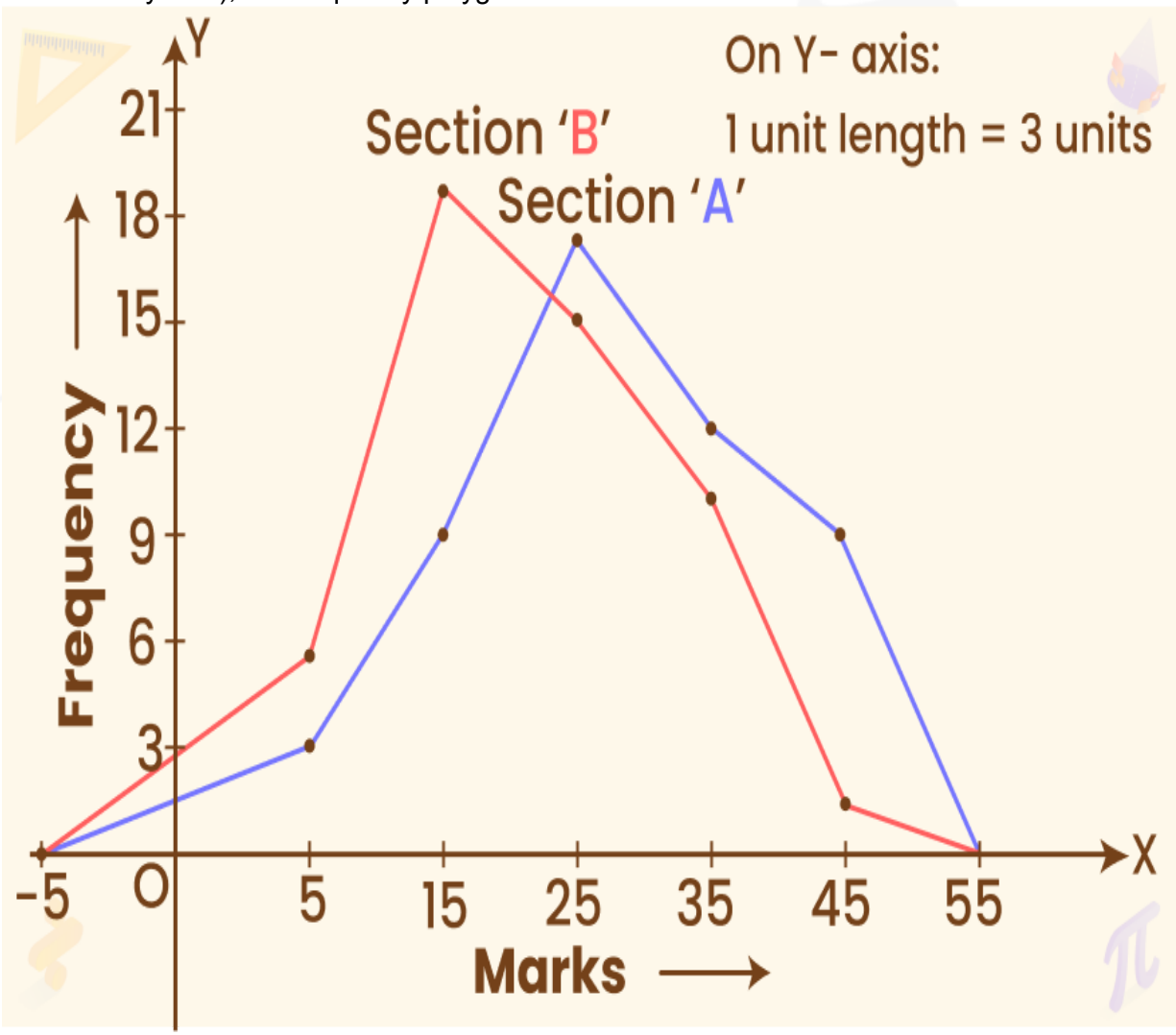
Represent the marks of the students of both the sections on the same graph by two frequency polygons. From the two polygons compare the performance of the two sections.

We can find the class marks of the given class intervals by using the following formula

$$\text{Class mark} = \frac{\text{Upper class limit} + \text{Lower class limit}}{2}$$

| 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 |

Taking class marks on x-axis and frequency on y-axis and choosing an appropriate scale (1 unit = 3 for y-axis), the frequency polygon can be drawn as follows.




It can be observed that the performance of students of section 'A' is better than the students of section 'B' in terms of good marks.

2. 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.

[4 marks]
[NCERT]
[Frequency Polygon]

It can be observed that the class intervals of the given data are not continuous. There is a gap of 1 in between them. Therefore, $\frac{1}{2} = 0.5$ has to be added to the upper class limits and 0.5 has to be subtracted from the lower class limits. Also, class mark of each interval can be found by using the following formula.

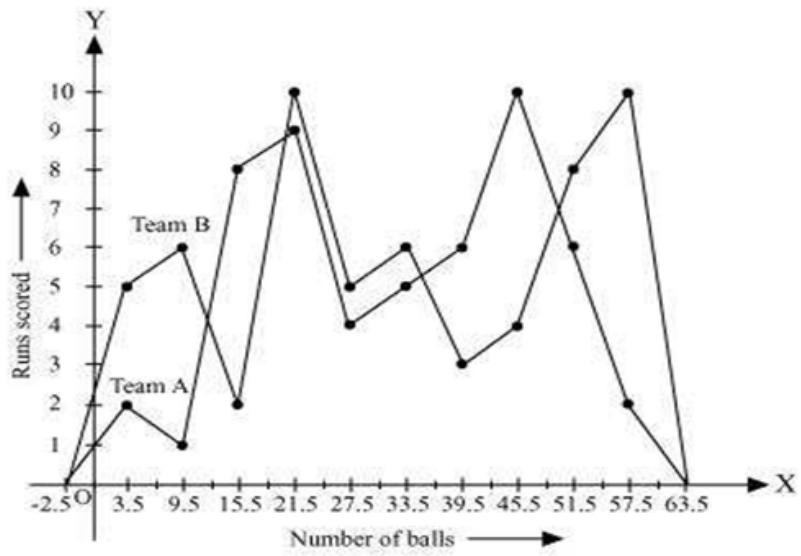
$$\text{Class mark} = \frac{\text{Upper class limit} + \text{Lower class limit}}{2}$$

Continuous data with class mark of each class interval can be represented as follows.

| Number of balls | Class mark | Team A | Team B |
|---|---|---|---|
| $0.5 - 6.5$ | 3.5 | 2 | 5 |
| $6.5 - 12.5$ | 9.5 | 1 | 6 |
| $12.5 - 18.5$ | 15.5 | 8 | 2 |
| $18.5 - 24.5$ | 21.5 | 9 | 10 |
| $24.5 - 30.5$ | 27.5 | 4 | 5 |
| $30.5 - 36.5$ | 33.5 | 5 | 6 |
| $36.5 - 42.5$ | 39.5 | 6 | 3 |
| $42.5 - 48.5$ | 45.5 | 10 | 4 |
| $48.5 - 54.5$ | 51.5 | 6 | 8 |
| $54.5 - 60.5$ | 57.5 | 2 | 10 |

[1 mark]

**Solution:**
By taking class marks on x-axis and runs scored on y-axis, a frequency polygon canbe constructed as follows.




[3 marks]

3. 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.

[4 marks]
[NCERT]
[Frequency Polygon]

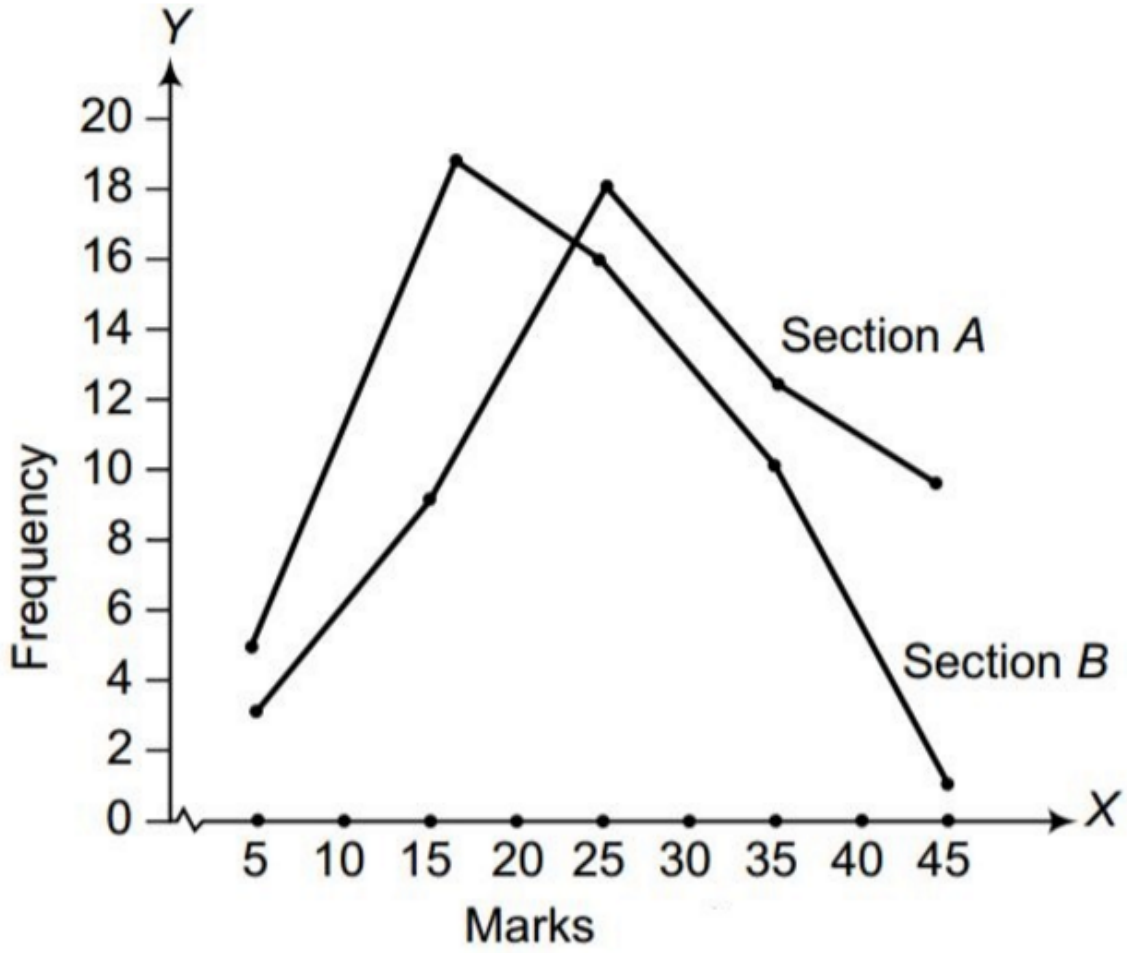
**Solution:**
We can find the class marks of the given class intervals by using the following formula.

$$\text{Class mark} = \frac{\text{Upper class limit} + \text{Lower class limit}}{2}$$

| 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 |
| $30-10$ | 35 | 12 | $30-40$ | 35 | 10 |
| $40-50$ | 45 | 9 | $40-50$ | 45 | 1 |

[1 mark]

Now, we draw frequency polygon for the given data.

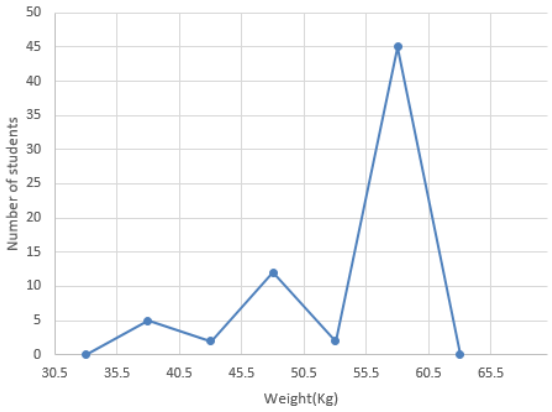



[3 marks]

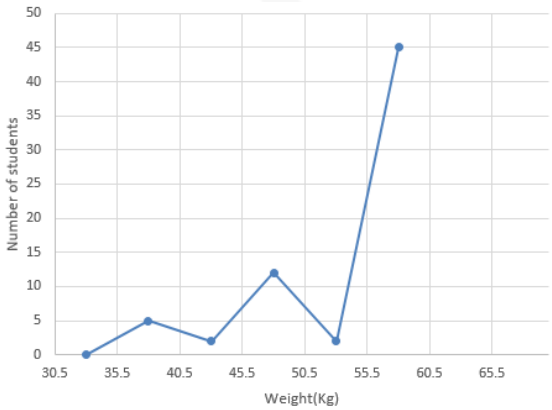
4. Which of the following is frequency polygon from the given data?

| $Weight(kg)$ | $NumberOfStudents$ |
|---|---|
| $35.5-40.5$ | 5 |
| $40.5-45.5$ | 2 |
| $45.5-50.5$ | 12 |
| $50.5-55.5$ | 2 |
| $55.5-60.5$ | 45 |

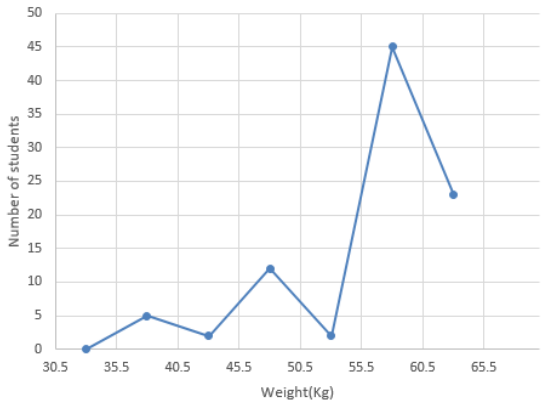
(a)

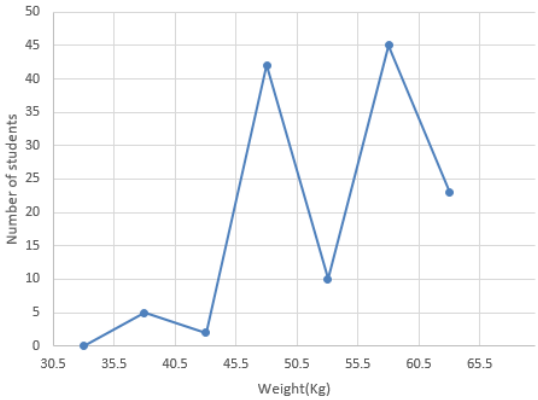



(b)




(c)



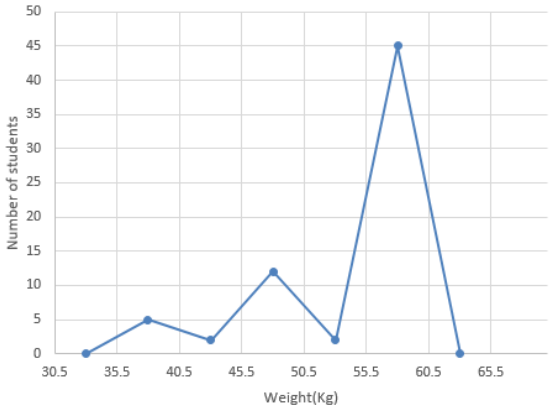
(d) 

[ 1 Mark]

A Frequency polygon is the graphical representation of both discrete and continuous frequency distribution.

Class marks are first calculated, then they are taken on the X-axis and the corresponding frequency on the Y-axis.

| Weight(Kg) | Class Marks | Number of students |
|---|---|---|
| 30.5 - 35.5 | 33 | 0 |
| 35.5 - 40.5 | 38 | 5 |
| 40.5 - 45.5 | 43 | 2 |
| 45.5 - 50.5 | 48 | 12 |
| 50.5 - 55.5 | 53 | 2 |
| 55.5 - 60.5 | 58 | 45 |
| 60.5 - 65.5 | 63 | 0 |




Scale used:
On X-axis 1 cm = 1 class interval length
On Y-axis 1 cm = 5 units

Although there exists no class preceding the lowest class and no class succeeding the highest class, addition of two class intervals with zero frequency makes the area of frequency polygon and area of the histogram as equal.

Correct Answer : (a) (1 mark)

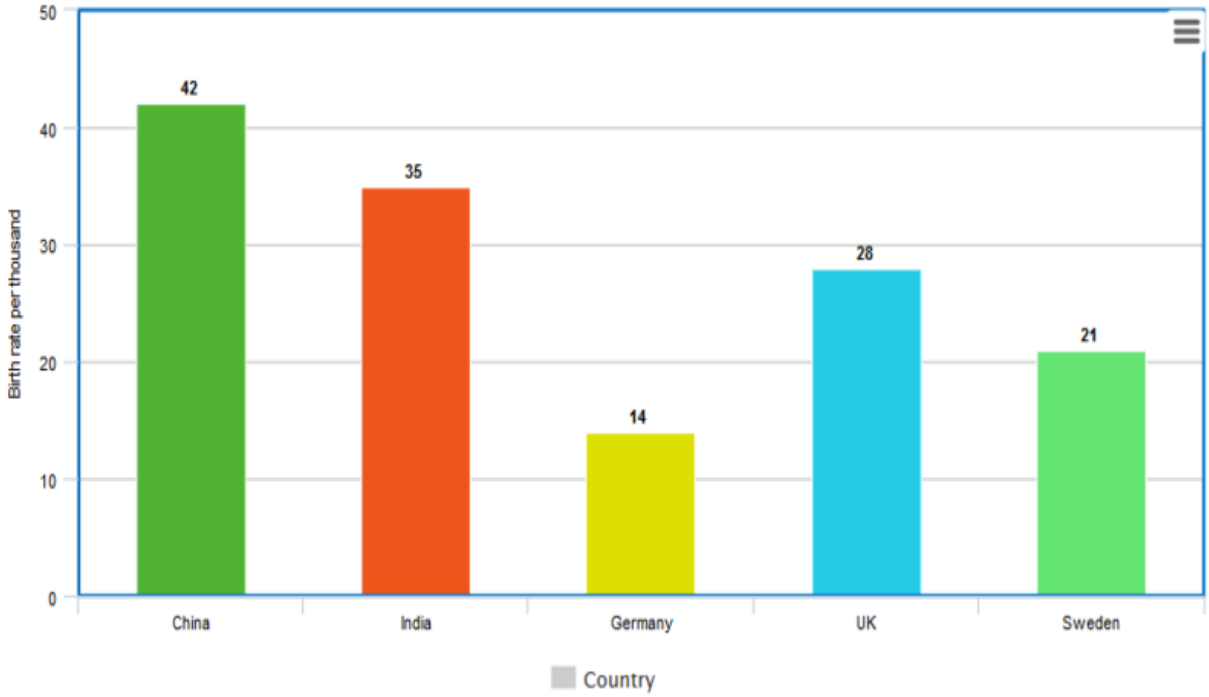
5. The birth rate per thousand in five countries over a period of time is show below:

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

Represent the above data by a bar graph.

[ 2 marks ]
[Bar Graph]

**Solution:**




( 2 marks )

6. 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.

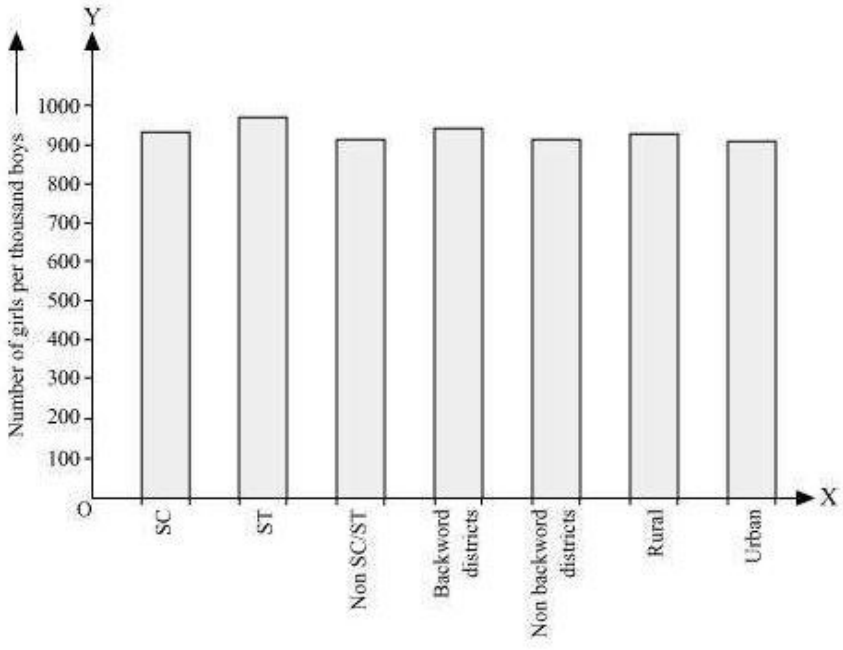
(ii) In the classroom discuss, what conclusions can be arrived at from the graph.

[ 3 marks ]

[Bar Graph]

**Solution:**

(i) By representing section (variable) on x-axis and number of girls per thousand boys on y-axis, the graph of the information given above can be constructed by choosing an appropriate scale(1 unit = 100 girls for y-axis)




Here, all the rectangle bars are of the same length and have equal spacing in between them. (2 marks)

(ii) It can be observed that the maximum number of girls per thousand boys (i.e.,970) is for ST and the minimum number of girls per thousand boys (i.e., 910) is for urban. Also, the number of girls per thousand boys is greater in rural areas than that in urban areas, backward districts than that in non-backward districts, SC and ST than that in non-SC/ST. (1 mark)

7. 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 |
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| Backward districts | 950 |
| Non-backward districts | 920 |
| Rural | 930 |
| Urban | 910 |

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

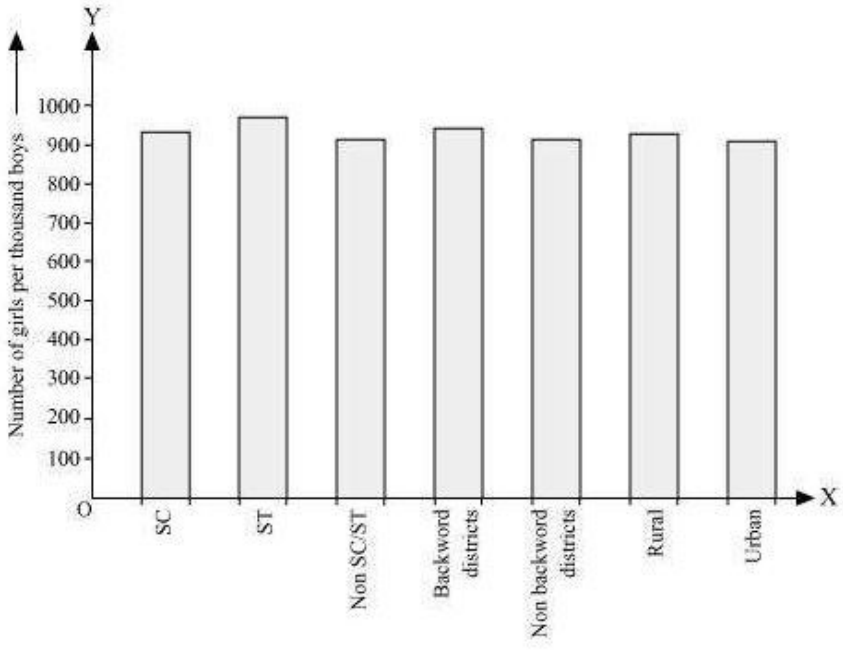
(ii) In the classroom discuss, what conclusions can be arrived at from the graph.

[ 3 marks ]

[Bar Graph]

**Solution:**

(i) By representing section (variable) on x-axis and number of girls per thousand boys on y-axis, the graph of the information given above can be constructed by choosing an appropriate scale(1 unit = 100 girls for y-axis)

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(ii) It can be observed that the maximum number of girls per thousand boys (i.e.,970) is for ST and the minimum number of girls per thousand boys (i.e., 910) is for urban. Also, the number of girls per thousand boys is greater in rural areas than that in urban areas, backward districts than that in non-backward districts, SC and ST than that in non-SC/ST. (1 mark)

8. A random survey of the number of children of various age groups playing in 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 |

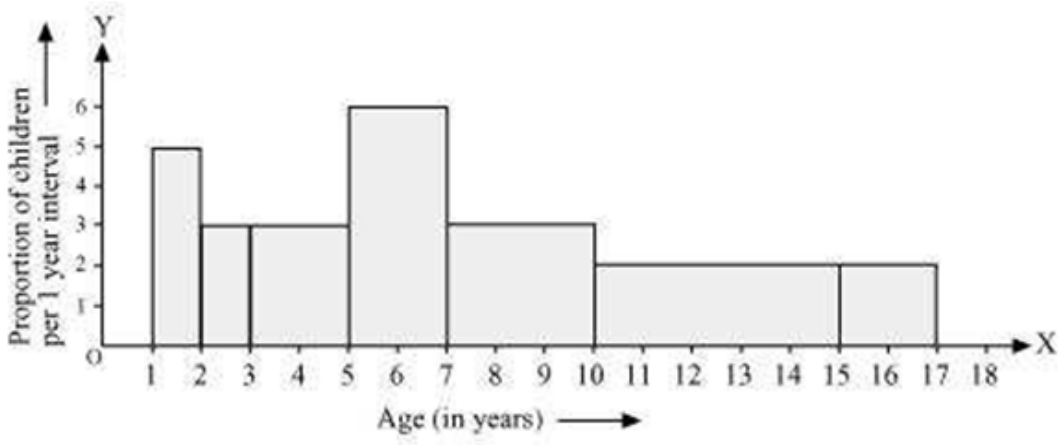
Draw a histogram to represent the data above. (3 marks)

Here, it can be observed that the data has class intervals of varying width. The proportion of children per 1 year interval can be calculated as follows.

| Age (in years) | Frequency (Number of children) | Width of class | Length of rectangle |
|---|---|---|---|
| $1-2$ | 5 | 1 | $\frac{5\times1}{1}=5$ |
| $2-3$ | 3 | 1 | $\frac{3\times1}{1}=3$ |
| $3-5$ | 6 | 2 | $\frac{6\times1}{2}=3$ |
| $5-7$ | 12 | 2 | $\frac{12\times1}{2}=6$ |
| $7-10$ | 9 | 3 | $\frac{9\times1}{3}=3$ |
| $10-15$ | 10 | 5 | $\frac{10\times1}{5}=2$ |
| $15-17$ | 4 | 2 | $\frac{4\times1}{2}=2$ |

( 2 marks)

Taking the age of children on x-axis and proportion of children per 1 year interval on y-axis, the histogram can be drawn as follows.




(1 mark)