



# Exercise 12.1



1. The following distribution represents the scores achieved by a group of chemistry students in the chemistry laboratory.

<b>Scores</b>	24–28	29–33	34–38	39–43	44–48	49–53	<b>Total</b>
<b>No. of students</b>	3	6	12	23	15	6	<b>65</b>

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**Answer the following questions.**

- (i) What is the upper limit of the last class?
- (ii) What is the lower limit of the class '39 – 43'?
- (iii) What is the midpoint of the class (34 - 38)?
- (iv) What are the class frequencies of the classes 29-33 and 44-48?
- (v) What is the size of the class limits in the above frequency distribution?
- (vi) In which class or group does minimum number of students fall?
- (vii) What is the lower limit of the class having 15 as its class frequency?
- (viii) What is the number of students having scores between 24 and 43?

**Solutions:**

- (i) Upper limit of last class = 53.
- (ii) Lower limit of class (39 – 43) is 39.
- (iii) Mid point of class (34 – 38) is  $\frac{34 + 38}{2} = 36$ .
- (iv) Size of class limits = 5.
- (v) The class containing minimum number of students in the class 1 having 3 students only.
- (vi) Class frequency of class (29 – 33) and (44 – 48) are '6' and '15' respectively.
- (vii) Lower limit of class of frequency 15 is 44.
- (viii) Number of students having scores between 24 and 43 are  $3 + 6 + 12 + 23 = 44$ .

2. For a school staff, the following expenditures (rupees in hundred) are required for the repair of chairs.

145, 152, 153, 156, 158, 160, 146, 152,  
155, 159, 161, 163, 165, 147, 148, 151,  
154, 156, 158, 160, 144, 167, 151, 150,  
152, 149, 145, 153, 152, 155

Prepare a frequency distribution by tally bar method using 3 as the size of class limits and also write down what are the frequencies of the last three classes?

**Sol:** 145 152 153 156 158 160 146 152 155 159  
 161 163 165 147 148 151 154 156 158 160  
 144 167 151 150 152 149 145 153 152 155

Class limits	Tally marks	$f$
144 - 146		4
147 - 149		3
150 - 152		7
153 - 155		5
156 - 158		4
159 - 161		4
162 - 164		1
165 - 167		2
<b>Total</b>		$\Sigma f = 30$

$$\begin{aligned} \text{No. of classes} &= \frac{\text{Max.} - \text{Min}}{x} \\ &= \frac{167 - 144}{3} \\ &= 8 \end{aligned}$$

3. Given below are the weights in kg of 30 students of a high school.

30, 33, 24, 21, 15, 39, 37, 44,  
 42, 33, 33, 28, 29, 32, 31, 28,  
 26, 32, 34, 35, 38, 36, 41, 30,  
 35, 41, 23, 26, 18, 34

Taking 5 as the size of the class limit, prepare a frequency table and construct a frequency polygon.

**Sol:** 30 33 24 21 15 39 37 44 42 33  
 33 28 29 32 31 28 26 32 34 35  
 38 36 41 30 35 41 23 26 18 34

$$\text{Number of groups} = \frac{44 - 15}{5} = \frac{29}{5} = 6$$

Class limits	Tally marks	$f$
15 - 19		2
20 - 24		3
25 - 29		5
30 - 34		10
35 - 39		6
40 - 44		4
<b>Total</b>		$\Sigma f = 30$

4. A group of Grade -10 students obtained the following marks out of 100 marks in English test.

58, 59, 58, 33, 40, 58, 45, 46,  
 43, 45, 45, 50, 52, 49, 50, 57,  
 52, 55, 49, 50, 62, 49, 48, 44,  
 42, 47, 46, 47, 46, 53, 40, 44

Classify the data into a frequency distribution by (direct method) taking 6 as the size of class limit. Also find the class limit with least class frequency and construct histogram for the data.

*Sol:* 58 59 58 33 40 58 45 46 43 45 45  
 50 52 49 50 57 52 55 49 50 62 49  
 48 44 42 47 46 47 46 53 40 44

$$\frac{\text{Max} - \text{Minimum}}{6} = \frac{62 - 33}{6} = \frac{29}{6} = 5$$

Class limits	Tally marks	$f$
33 - 38		1
39 - 44		6
45 - 50		15
51 - 56		4
57 - 62		6
<b>Total</b>		$\Sigma f = 30$

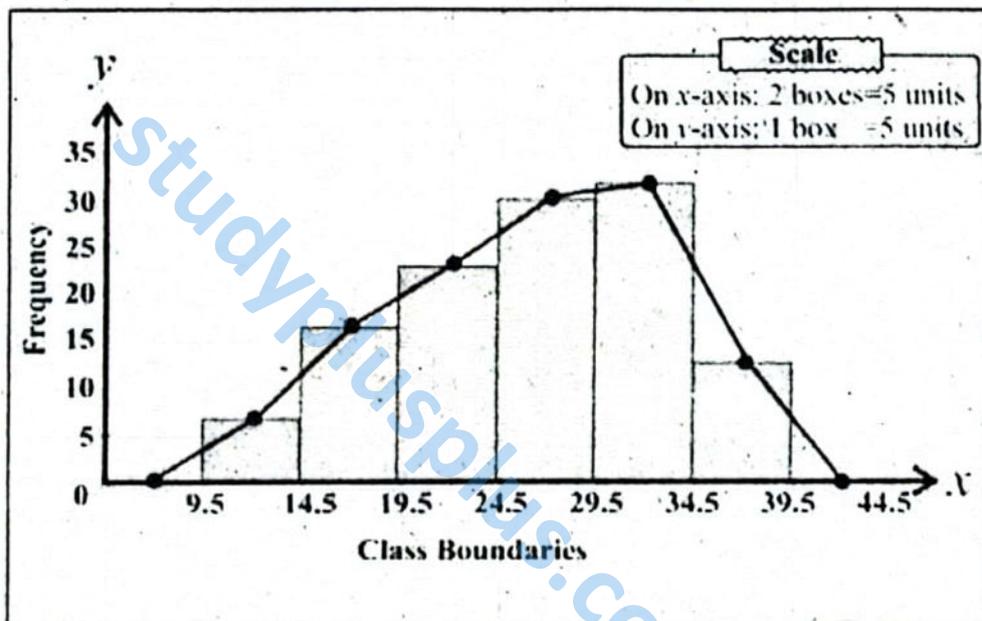
5. From the table given below. Draw a frequency polygon on histogram for the given frequency distribution.

Weight (kg)	10-14	15-19	20-24	25-29	30-34	35-39
Frequency (f)	06	17	23	30	22	13

Sol:

Weight (kg)	10 - 14	15-19	20-24	25 - 29	30-34	35 - 39
Frequency (f)	06	17	23	30	22	13

**Title** Frequency polygon on histogram



6. The following data shows the number of heads in an experiment of 50 sets of tossing a coin 5 times. Make a discrete frequency distribution from the information.
- 3, 3, 4, 0, 5, 4, 3, 3, 1, 2, 4, 5, 0, 3, 2, 4, 4, 0, 0, 0, 5, 5, 3, 2, 1  
3, 2, 5, 3, 2, 1, 3, 5, 4, 3, 2, 1, 3, 2, 1, 3, 1, 3, 1, 4, 3, 2, 2, 4

Sol: 3, 3, 4, 0, 5, 4, 3, 3, 1, 2, 4, 5, 0, 3, 2, 4, 4, 0, 0, 0, 5, 5, 3, 2, 1.  
4, 3, 2, 5, 3, 2, 1, 3, 5, 4, 3, 2, 1, 3, 2, 1, 3, 1, 3, 1, 4, 3, 2, 2, 4.

Number of Heads	Tally marks	Frequency
0		5
1		7
2		9
3		14
4		9
5		6
Total		$\Sigma f = 50$

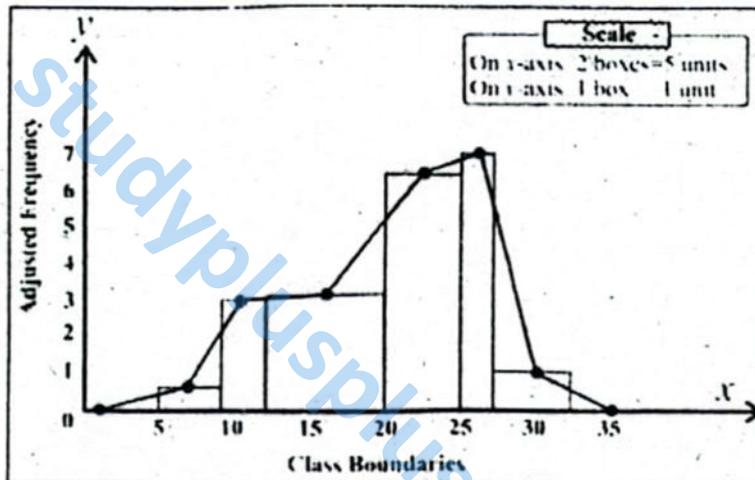
7. The marks obtained by the students of Grade-10 in mathematics test were grouped into the following frequency distribution.

<b>Marks</b>	35-37	38-44	45-54	55-61	62-67	68-72
<b>Frequency</b>	2	12	16	13	9	3

Draw a histogram for the above distribution.

<b>Marks</b>	35-37	38-44	45-54	55-61	62-67	68-72
<b>Frequency (f)</b>	2	12	16	13	9	3

**Title** Frequency polygon on histogram



8. Make a frequency polygon on histogram for the following grouped data:

<b>Class limits</b>	5-8	8-12	12-20	20-25	25-27	27-32
<b>Frequency (f)</b>	2	12	25	32	14	5

<b>Class limit</b>	5-8	8-12	12-20	20-25	25-27	27-32
<b>Frequency (f)</b>	2	12	25	32	14	5

**Title** Frequency polygon on histogram

