

### EXERCISE 14.3

The blood groups of 30 students are recorded as follows:

A, B, O, A, AB, O, A, O, B, A, O, B, A, AB, B, A, AB, B,  
A, A, O, A, AB, B, A, O, B, A, B, A

Prepare a frequency distribution table for the data.

**Solution:**

The frequency distribution table for the data is as follows:

Blood group	Frequency
A	12
AB	4
B	8
O	6
Total	30

1. The value of  $\pi$  upto 35 decimal places is given below:

2. 14159265358979323846264338327950288

Make a frequency distribution of the digits 0 to 9 after the decimal point.

**Solution:**

The frequency distribution of the digits 0 to 9 after the decimal point is as follows:

Digits	Frequency
0	1
1	2
2	5
3	6
4	3
5	4
6	3
7	2
8	5
9	4

3. The scores (out of 100) obtained by 33 students in a mathematics test are as follows:

69, 48, 84, 58, 48, 73, 83, 48, 66, 58, 84 000

66, 64, 71, 64, 66, 69, 66, 83, 66, 69, 71

81, 71, 73, 69, 66, 66, 64, 58, 64, 69, 69

Represent this data in the form of a frequency distribution.

**Solution:**

The given data in the question in a frequency distribution table can be represented as:

Scores	N/O students Frequency
48	3
58	3
64	4
66	7
69	6
71	3
73	2
81	1
83	2
84	2

4. Prepare a continuous grouped frequency distribution from the following data:

Mid-point	Frequency
5	4
15	8
25	13
35	12
45	6

Also find the size of class intervals.

**Solution:**

If  $m$  is mid-point of a class and  $h$  is the class size,

We know that,

Lower limits of the class intervals =  $m - h/2$

Upper limits of the class intervals =  $m + h/2$ .

Class size ( $h$ ) =  $15 - 5 = 10$  ... (i)

Then,

The class interval formed for the mid-point 5 =  $(5 - 10/2) - (5 + 10/2)$   
 $= 0 - 10$

Continuing in the same manner, the continuous class table is:

Mid-point	0-10	10-20	20-30	30-40	40-50
Frequency	4	8	13	12	6

The size of class intervals = 10 (from equation 1)

5. Convert the given frequency distribution into a continuous grouped frequency distribution:

Class interval	Frequency
150-153	7
154-157	7
158-161	15
162-165	10
166-169	5
170-173	6

In which intervals would 153.5 and 157.5 be included?

**Solution:**

Consider the classes 150 - 153 and 154 - 157.

The lower limit of 154 - 157 = 154

The upper limit of 150 - 153 = 153

The difference = 154 - 153 = 1

Half the difference =  $1/2 = 0.5$

Therefore,

The new class interval formed from 150 - 153 =  $(150 - 0.5) - (153 + 0.5)$   
 $= 149.5 - 153.5.$

Continuous classes formed can be represented in a table as:

Class Interval	Frequency
149.5 - 153.5	7
153.5 - 157.5	7
157.5 - 161.5	15
161.5 - 165.5	10
165.5 - 169.5	5
169.5 - 173.5	6

Hence, from the table,

It is clear that 153.5 belongs to the class interval 153.5 - 157.5 and 157.5 belongs to the class interval 157.5 - 161.5.

6. The expenditure of a family on different heads in a month is given below:

Head	Food	Education	Clothing	House Rent	Others	Savings
Expenditure (in Rs)	4000	2500	1000	3500	2500	1500

Draw a bar graph to represent the data above.

Solution:



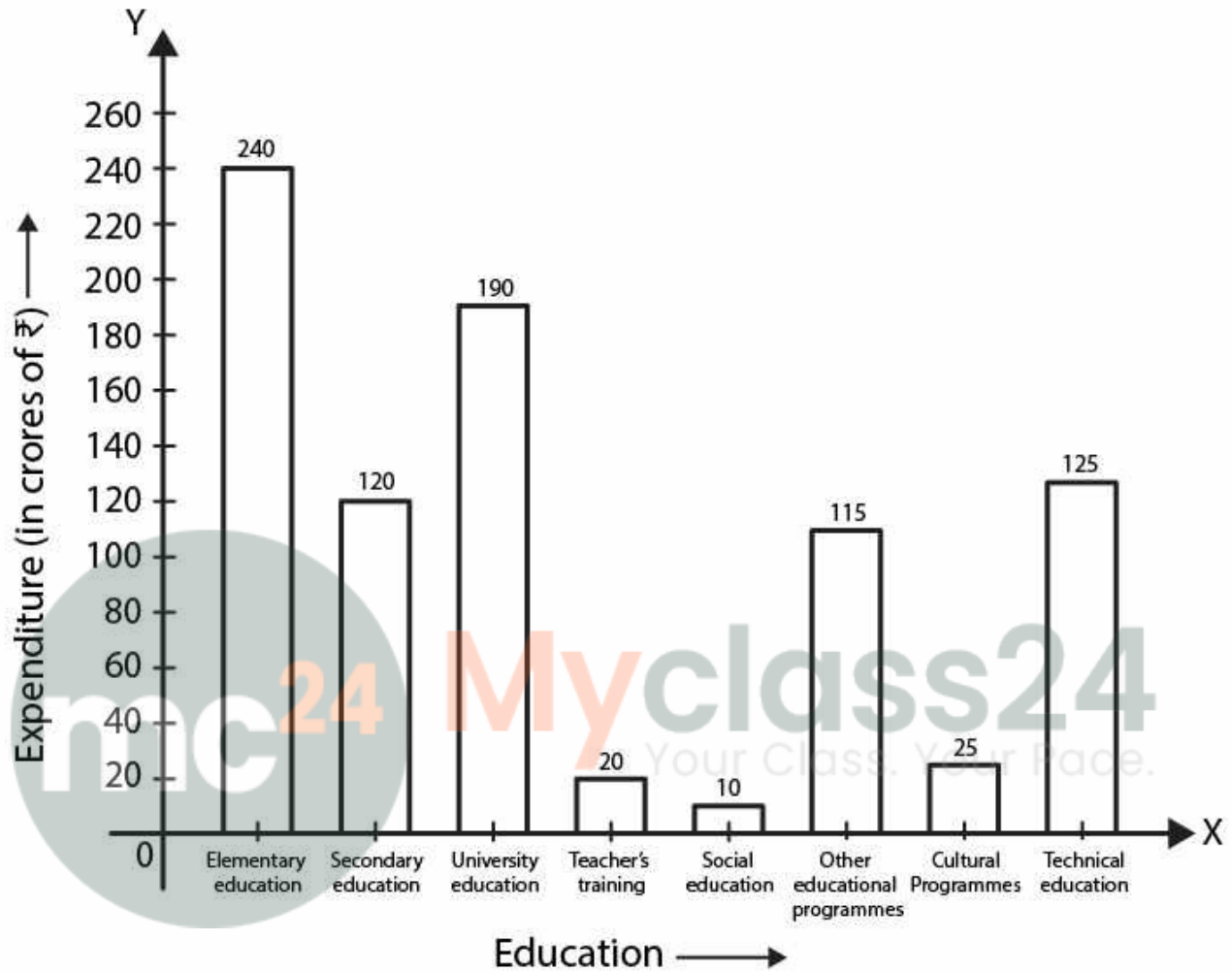
7. Expenditure on Education of a country during a five year period (2002-2006), in crores of rupees, is given below:

Elementary education	240
Secondary Education	120
University Education	190
Teacher's Training	20
Social Education	10
Other Educational Programmes	115
Cultural programmes	25
Technical Education	125

Represent the information above by a bar graph.

**Solution:**

The given data can be represented by a bar graph as follows:

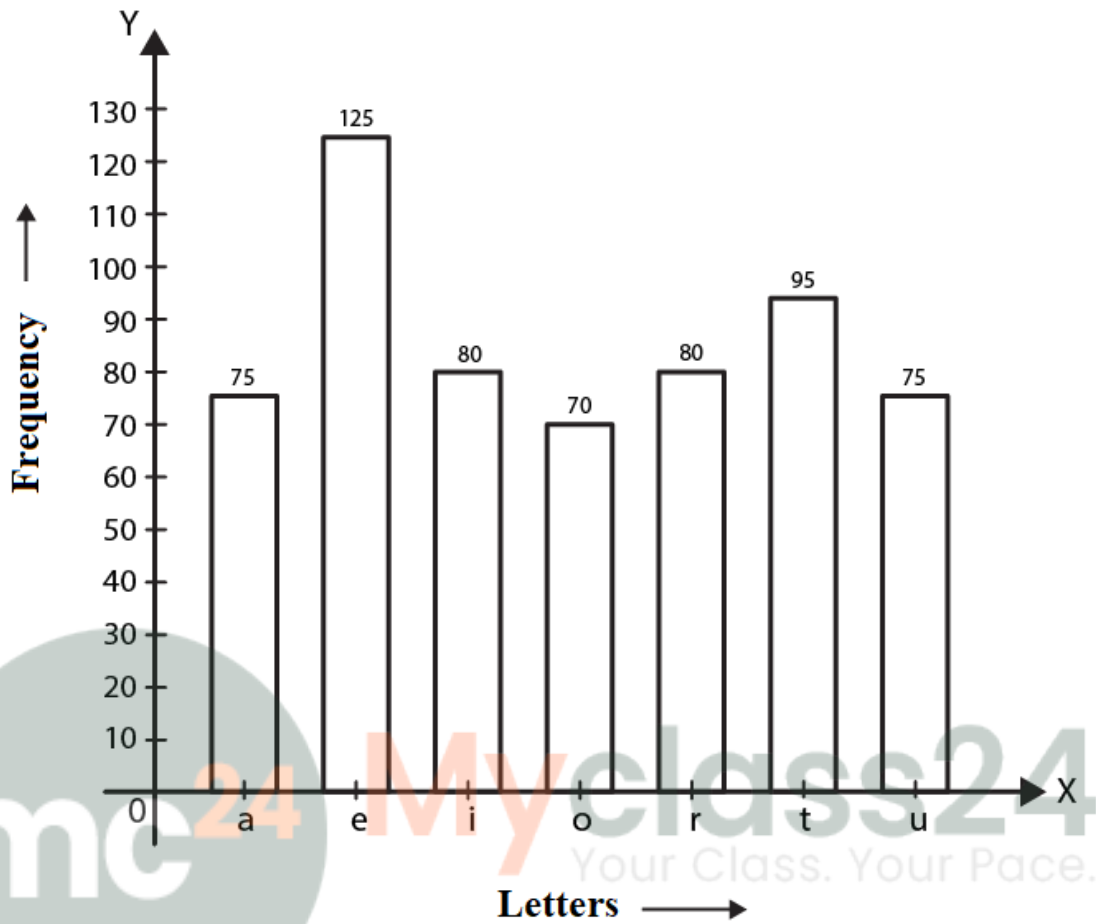


<b>Letters</b>	<i>a</i>	<i>e</i>	<i>i</i>	<i>o</i>	<i>r</i>	<i>t</i>	<i>u</i>
<b>Frequency</b>	75	125	80	70	80	95	75

Represent the information above by a bar graph.

**Solution:**

The given data can be represented by a bar graph as follows:



9. If the mean of the following data is 20.2, find the value of p:

$x$	10	15	20	25	30
$f$	6	8	$p$	10	6

**Solution:**

According to the question,

$$\text{Mean} = 20.2$$

So,

$$\frac{\sum fix_i}{\sum f_i} = 20.2$$

So we get,

$$\begin{aligned} \sum fix_i &= (10 \times 6) + (15 \times 8) + (20 \times p) + (25 \times 10) + (30 \times 6) \\ &= 610 + 20p \end{aligned}$$

We also get,

$$\begin{aligned} \sum f_i &= 6 + 8 + p + 10 + 6 \\ &= 30 + p \end{aligned}$$

Therefore,

$$\begin{aligned} \sum f_i x_i / \sum f_i &= 20.2 \\ (610 + 20p) / 30 + p &= 20.2 \\ 20.2(30 + p) &= 610 + 20p \\ 606 + 20.2p &= 610 + 20p \\ 20.2p - 20p &= 610 - 606 \\ 0.2p &= 4 \\ p &= 4 / 0.2 \\ p &= 20 \end{aligned}$$

10. Obtain the mean of the following distribution:

Frequency	Variable
4	4
8	6
14	8
11	10
3	12

Solution:

$x_i$	$f_i$	$x_i f_i$
4	4	16
6	8	48
8	14	112
10	11	110
12	3	36
Total	40	322

$$\text{Mean} = \frac{\sum x_i f_i}{\sum f_i} = \frac{322}{40} = 8.05$$