EXERCISE 14.2

The frequency distribution:

Marks	0-20	20-40	40-60	60-100
Number of Students	10	15	20	25

has been represented graphically as follows :

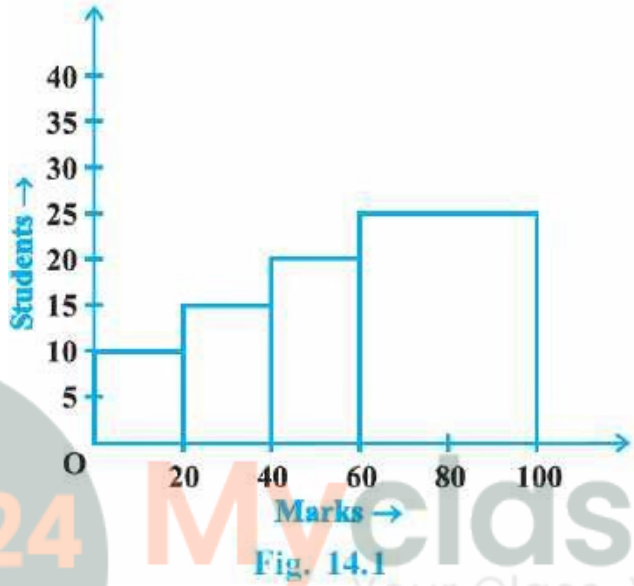

Fig. 14.1

Do you think this representation is correct? Why?

Solution:

No, the above representation is not correct.

Reason:

The classes 0 – 20, 20 – 40, 40 – 60 and 60 – 100 are not of uniform width but of varying widths.

1. In a diagnostic test in mathematics given to students, the following marks (out of 100) are recorded:

46, 52, 48, 11, 41, 62, 54, 53, 96, 40, 98, 44

Which 'average' will be a good representative of the above data and why?

Solution:

Median will be a good representative of the data given in the question, because

a) each value occurs once.

b) the data is influenced by extreme values.

2. A child says that the median of 3, 14, 18, 20, 5 is 18. What doesn't the child understand about finding the median?

Solution:

Since the child says that the median of 3, 14, 18, 20, 5 is 18, it is clear that the child doesn't understand the fact that the given data should be arranged in ascending or descending order before finding the middle term, i.e., median.

Once the child is familiar with the concept,

He/she will understand that,
Arranging the given data in ascending order, we get,
3, 5, 14, 18, 20
And hence,
The median = 14

3. A football player scored the following number of goals in the 10 matches:
1, 3, 2, 5, 8, 6, 1, 4, 7, 9
Since the number of matches is 10 (an even number), therefore, the median
= (5th observation + 6th observation)/2 = (8+6)/2 = 7
Is it the correct answer and why?
Solution:

No.
The obtained data solution in the question not the correct answer, because the data has to be arranged in either ascending or descending order before finding the median.
Now,
Arranging the data in ascending order, we get,
1, 1, 2, 3, 4, 5, 6, 7, 8, 9.
Here, number of observations is 10, which is even.
So, median = $((n/2)^{th}$ observation + $((n/2)+1)^{th}$ observation)/2
= $((10/2)^{th}$ observation + $((10/2)+1)^{th}$ observation)/2
= $((5)^{th}$ observation + $(6)^{th}$ observation)/2
= (4 + 5)/2
= 9/2
= 4.5

4. Is it correct to say that in a histogram, the area of each rectangle is proportional to the class size of the corresponding class interval? If not, correct the statement.
Solution:
The statement "in a histogram, the area of each rectangle is proportional to the class size of the corresponding class interval" is not correct. Because in a histogram, the area of each rectangle is proportional to the corresponding frequency of its class.