Sample Question 3 : The percentage of marks obtained by 100 students in an examination are given below:

Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65
Frequency	14	16	18	23	18	8	3

Determine the median percentage of marks.

Solution :

Marks (Class)	**Number of Students (Frequency)**	**Cumulative frequency**	
30-35	14	14	
35-40	16	30	
40-45	18	48	
45-50	23	71	← Median class
50-55	18	89	
55-60	8	97	
60-65	3	100	

Here, $n = 100$.

Therefore, $\frac{n}{2} = 50$, This observation lies in the class 45-50.

l (the lower limit of the median class) = 45

cf (the cumulative frequency of the class preceding the median class) = 48

f (the frequency of the median class) = 23

h (the class size) = 5

$$\text{Median} = l + \left(\frac{\frac{n}{2} - \text{cf}}{f}\right)h$$

$$= 45 + \left(\frac{50-48}{23}\right) \times 5$$

$$= 45 + \frac{10}{23} = 45.4$$

So, the median percentage of marks is 45.4.

Hint: The cumulative frequency of a class is the frequency obtained by adding the frequencies of all the classes preceding the given class.