Question:

Calculate the mean from the following data:

Marks	1–5	6–10	11–15	16–20	21–25	26–30	31–35	36–40	41–45
No. of Students	7	10	16	30	24	17	10	5	1

Solution: Calculation of Mean

To calculate the **mean**, we use the **midpoint method** (also known as the **assumed mean method**).

Step 1: Compute Class Midpoints

The **class midpoint** (x_i) for each class is calculated as:

$$x_i = \frac{\text{Lower Bound} + \text{Upper Bound}}{2}$$

Marks (Class Interval)	No. of Students (f_i)	Midpoint (x_i)	$f_i \times x_i$
1 – 5	7	$\frac{1+5}{2} = 3$	$7 \times 3 = 21$
6 – 10	10	$\frac{6+10}{2} = 8$	$10 \times 8 = 80$
11 – 15	16	$\frac{11+15}{2} = 13$	$16 \times 13 = 208$
16 – 20	30	$\frac{16+20}{2} = 18$	$30 \times 18 = 540$
21 – 25	24	$\frac{21+25}{2} = 23$	$24 \times 23 = 552$
26 – 30	17	$\frac{26+30}{2} = 28$	$17 \times 28 = 476$
31 – 35	10	$\frac{31+35}{2} = 33$	$10 \times 33 = 330$
36 – 40	5	$\frac{36+40}{2} = 38$	$5 \times 38 = 190$
41 – 45	1	$\frac{41+45}{2} = 43$	$1 \times 43 = 43$

Step 2: Compute Mean Using the Formula

The **mean formula for a grouped frequency distribution** is:

$$\bar{X} = \frac{\sum f_i x_i}{\sum f_i}$$

Summation Values:

$$\sum f_i = 7 + 10 + 16 + 30 + 24 + 17 + 10 + 5 + 1 = 120$$

$$\sum f_i x_i = 21 + 80 + 208 + 540 + 552 + 476 + 330 + 190 + 43 = 2440$$

Now, applying the values in the formula:

$$\bar{X} = \frac{2440}{120} = 20.33$$

Final Answer:

The **mean marks** of students = **20.33**