Exercise 14G

Question 7:
The ten observations in ascending order:
10, 13, 15, 18, x+1, x+3, 30, 32, 35, 41
Here, n =10, which is even

$$\therefore \text{median} = \frac{1}{2}\left[\left(\frac{n}{2}\right)\text{thterm} + \left(\frac{n}{2}+1\right)\text{th term}\right]$$

$$= \frac{1}{2}\left[(5\text{th term} + 6\text{th term})\right][\because n = 10]$$

$$= \frac{1}{2}(x+1+x+3)$$

$$= \frac{1}{2}(2x+4)$$

$$= x+2$$

$$\therefore \quad \text{median} = x + 2$$

$$\text{But median} = 24 \text{ (given)}$$

$$\therefore \quad x + 2 = 24$$

$$\Rightarrow \quad x = 24 - 2$$

$$\therefore \quad x = 22$$

Question 8:

Let us now prepare the cumulative frequency table.

Weight (in kg)	No. of students	Cumulative frequency
45	8	8
46	5	13
48	6	19
50	9	28
52	7	35
54	4	39
55	2	41

Total n =41, which is odd

$$\text{median weight} = \left(\frac{n+1}{2}\right)\text{th term}$$

$$= \left(\frac{41+1}{2}\right)\text{th term}$$

$$= \text{value of 21st term}$$

$\therefore$ median weight =weight of the 21^{st} student

But the above table shows that each one of the students from 20^{th} to 28^{th} has 50 kg as his weight.

$\therefore$ the weight of the 21st student will be 50kg.

Hence median weight = 50 kg.

********** END **********