

Exercise 14G

Question 7:

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

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

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

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

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

$$= x + 2$$

$$\therefore \text{ median} = x + 2$$
But median = 24 (given)
$$\therefore x + 2 = 24$$

$$\Rightarrow x = 24 - 2$$

$$\therefore x = 22$$

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

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

$$= value \ of \ 21st \ term$$

∴ median weight =weight of the 21st student

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

... the weight of the 21st student will be 50kg.

Hence median weight = 50 kg.

