



Arithmetic Progressions Ex 19.7 Q5

There are 25 trees at equal distance of 5 m in a line with a well(w), and the distance of the well from the nearest tree = 10 m.

Thus,

The total distance travelled by gardener to tree 1 and back is $2 \times 10 \text{ m} = 20 \text{ m}$

Similarly for all the 25 trees.

The distance covered by gardener is

$$= 2[10 + (10 + 5) + (10 + 2 \times 5) + (10 + 3 \times 5) + \dots + (10 + 23 \times 5)] \quad \text{---(i)}$$

This forms a series of 1st term $a = 10$, common difference $d = 5$ and $n = 25$

$$\therefore 10 + (10 + 5) + (10 + 2 \times 5) + \dots + (10 + 24 \times 5)$$

$$\Rightarrow S_{25} = \frac{25}{2} [2 \times 10 + (24)5] = 25[10 + 60] = 1750 \text{ m} \quad \text{---(ii)}$$

From (i) and (ii)

$$\text{Total distance} = 2 \times 1750 \text{ m} = 3500 \text{ m}.$$

Arithmetic Progressions Ex 19.7 Q6

The man counts at the rate of Rs 180 per minute for half an hour. After this he counts at the rate of Rs 3 less every minute than preceding minute.

Then, the amount counted in first 30 minute

$$= \text{Rs } 180 \times 30 = \text{Rs } 5400 \quad \text{---(i)}$$

The amount left to be counted after 30 minute

$$= \text{Rs } 10710 - 5400 = \text{Rs } 5310 \quad \text{---(ii)}$$

ATQ

$$\text{A.P formed is } (180 - 3) + (180 - 2 \times 3) + \dots = 5310$$

Let time taken to count 5310 be t

Then,

$$S_t = \frac{t}{2} [(180 - 3) + (t - 1)(-3)]$$

$$5310 = \frac{t}{2} [200 - 3t]$$

$$\text{or } t = 59 \text{ minute}$$

Thus, the total time taken by the man to count Rs 10710 is $(59 + 30) = 89$ minutes.

Arithmetic Progressions Ex 19.7 Q7

The piece of equipment depreciates 15% in first year i.e., $\frac{15}{100} \times 600,000 = \text{Rs } 90,000$

$$\therefore \text{Value after 1st year} = 600,000 - 90,000 = \text{Rs } 510,000 \quad \text{---(i)}$$

The equipment depreciates at the rate 135% in 2nd year i.e., $\frac{135}{1000} \times 600,000 = 81000$

$$\therefore \text{Value after 2nd year} = 81000$$

The value after 3rd year = $\frac{12}{100} \times 600000 = 72000$

The total depreciation in 10 years

$$\begin{aligned} \Rightarrow S_{10} &= \frac{10}{2} [2 \times 81000 + (9)(-9000)] \\ &= 5[81000] \quad \left[\text{Using } S_n = \frac{n}{2} [2a + (n-1)d] \right] \\ &= 405000 \end{aligned}$$

$$\therefore \text{The cost of machine after 10 years} = \text{Rs } 600000 - 405000 = 195000.$$

Arithmetic Progressions Ex 19.7 Q8

Total cost of tractor

$$\begin{aligned} &= 6000 + \left[(500 + 12\% \text{ of } 6000 \text{ for } 1 \text{ year}) + (500 + 12\% \text{ of } 5500 \text{ for } 1 \text{ year}) + \dots + 12 \text{ times} \right] \\ &= 6000 + 6000 + \frac{12}{100} (6000 + 5500 + \dots + 12 \text{ times}) \\ &= 12000 + \frac{12}{100} \left[\frac{12}{2} (6000 + 5000) \right] \\ &= 12000 + \frac{12}{100} \times \frac{12}{2} \times 6500 \\ &= 12000 + (72 \times 65) \\ &= 12000 + 4680 \\ &= 16680 \end{aligned}$$

Total cost of tractor = Rs. 16680

***** END *****