Arithematic Progressions Ex 19.7 Q9

Total cost of Scooter

$$= Rs\,4000 + \begin{bmatrix} \{Rs\ 1000 + S.I.\ on\ Rs\ Rs\ 18000\ for\ 1\ year\} \\ +\{Rs\ 1000 + S.I.\ on\ Rs\ Rs\ 17000\ for\ 1\ year\} \\ +.....+18\ times \end{bmatrix}$$

$$= (4000 + 18000) + S.I.\ for\ 1\ year\ on\ (18000 + 17000 + ...to\ 18\ times)$$

$$= 22000 + S.I.\ for\ 1\ year\ on\ \left\{\frac{18}{2}(18000 + 1000)\right\}$$

$$= 22000 + 9(19000) \times \frac{10}{100}$$

$$= 22000 + 17100$$

$$= Rs\ 39100$$

Total cost of Scooter = Rs. 39100

Arithematic Progressions Ex 19.7 Q10

First year the person income is: 300,000

Second year his income will be: $300,000 + 10,000 = 310,000$

⋮

⋮

This way he receives the amount after 20 years will be:

$$300,000 + 310,000 + \cdots + 490,000$$

This is an AP with first term $a = 300000$ and common difference $d = 10,000$.
Therefore

$$S = \frac{20}{2}\left[2 \cdot 300000 + (20 - 1)10000\right]$$

$$= 10\left[600000 + 190000\right]$$

$$= 7900000$$

Arithematic Progressions Ex 19.7 Q11

In 1st installment the man paid 100 rupees.

In 2nd installment the man paid $(100 + 5) = 105$ rupees.

⋮

⋮

Likewise he pays up to the 30th installment as follows:

$$100 + 105 + \cdots + (100 + 5 \times 29)$$

This is an AP with $a = 100$ and common difference $d = 5$.
Therefore at the 30th installment the amount he will pay

$$T_{30} = 100 + (30 - 1)(5)$$

$$= 100 + 145$$

$$= 245$$

Arithematic Progressions Ex 19.7 Q12

Suppose carpenter took n days to finish his job.

First day carpenter made five frames
$a_1 = 5$

Each day after first day he made two more frames
$d = 2$

$\therefore$ On n^{th} day frames made by carpenter are,
$a_n = a_1 + (n-1)d$
$\Rightarrow a_n = 5 + (n-1)2$

Sum of all the frames till n^{th} day is
$S = \dfrac{n}{2}\left[a_1 + a_n\right]$
$192 = \dfrac{n}{2}\left[5 + 5 + (n-1)2\right]$
$192 = 5n + n^2 - n$
$n^2 + 4n - 192 = 0$
$(n + 16)(n - 12) = 0$
$n = -16$ or $n = 12$

But number of days cannot be negative hence n = 12.

The carpenter took 12 days to finish his job.

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