Arithematic Progressions Ex 19.7 Q9

Total cost of Scooter

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

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

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

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

$$= 22000 + 17100$$

$$= \text{Rs } 39100$$

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: $300,000 + 10,000 = 310,000$

$\vdots$

$\vdots$

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 1^{st} installment the man paid 100 rupees.

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

$\vdots$

$\vdots$

Likewise he pays up to the 30^{th} 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 30^{th} 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

∴ 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

$$S = \frac{n}{2}[a_1 + a_n]$$

$$192 = \frac{n}{2}[5 + 5 + (n-1)2]$$

$192 = 5n + n^2 - n$
$n^2 + 4n - 192 = 0$
$(n+16)(n-12) = 0$
$n = -16$ or $n = 12$

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

The carpenter took 12 days to finish his job.

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