Arithematic Progressions Ex 19.7 Q1

Let the amount saved by the man in first year be x.

Then,

$$ATQ$$

$$x + (x + 100) + (x + 200) + \ldots + (x + 900) = 16500$$

As his saving increased by Rs 100 every year.

$$\therefore \quad 10x + 100 + 200 + \ldots + 900 = 16500 \qquad \text{---(i)}$$

Here,

$$100 + 200 + 300 + \ldots + 900 \text{ form a seried of}$$

$$a = 100, \ d = 100 \text{ and } n = 9$$

So,

$$S_n = \frac{n}{2}[a + l]$$

$$S_9 = \frac{9}{2}[100 + 900] = 4500 \qquad \text{---(ii)}$$

From (i) and (ii)

$$10x + (4500) = 16500$$

$$10x = 12000$$

or $\quad x = 1200$

The man saved Rs 1200 in the first year.

Arithematic Progressions Ex 19.7 Q2

Let the man save Rs 200 in n numbers of years.

Then,

$$ATQ$$

$$32 + 36 + 40 + \ldots = 200$$

It rorms a series of n terms, with $a = 32$ and $d = 4$

$$\therefore \quad S_n = \frac{n}{2}[2a + (n-1)d]$$

$$\Rightarrow \quad 200 = \frac{n}{2}[2(32) + (n-1)4]$$

$$\Rightarrow \quad 400 = 60n + 4n^2$$

$$\Rightarrow \quad n^2 + 15n - 100 = 0$$

$$\Rightarrow \quad n = 5 \text{ or } -20$$

But, $\quad n \neq -20 \qquad\qquad$ [It can't be negative]

$$\therefore \quad n = 5$$

The man will save Rs 200 in 5 years.

Arithematic Progressions Ex 19.7 Q3

Let the 40 annual instalments form an alithmetic series of common diference d and first instalment a

Then, series so firmed is

$$a + (a + d) + (a + 2d) + \ldots = 3600$$

or $\quad s_n = \frac{n}{2}[2a + (n-1)d]$

or $\quad 3600 = 20[2a + 39d]$

$$2a + 39d = 180 \qquad \text{---(i)}$$

and sum of first 30 terms is $\frac{2}{3}$ of 3600

$$= 2400$$

$$\Rightarrow \quad 2400 = \frac{30}{2}[2a + (29)d]$$

or $\quad 2a + 29d = 160 \qquad \text{---(ii)}$

From (i) and (ii)

$$a = 51$$

The first installment paid by this man is Rs 51.

Arithematic Progressions Ex 19.7 Q4

Let the number of Radio manufactured increase by x each year and number of radio manufacture in first year be a. So, A.P formed ATQ is

$\qquad a, a + x, a + 2x, \ldots$

Here,

$\qquad a_3 = a + 2x = 600$ $\qquad\qquad\qquad\qquad$ ---(i)

$\qquad a_7 = a + 6x = 700$ $\qquad\qquad\qquad\qquad$ ---(ii)

From (i) and (ii)

$\qquad a = 550, \ x = 25$

(i) 550 Radio's were manufactured in the first year.

(ii) The total produce in 7 years is sum of produce in the first 7 years.

$\qquad S_7 = \dfrac{7}{2}[550 + 700]$ $\qquad\qquad\qquad \left[\because S_n = \dfrac{n}{2}[a + l]\right]$

$\qquad\quad = 4375$

4375 Radio's were manufactured in first 7 years.

(iii) The product in 10th year

$\qquad a_{10} = a + 9d$

$\qquad\quad = 550 + 9(25) = 775$

775 Radio's were manufactured in the 10th year.

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