10.5.3.15

EE23BTECH11062 - V MANAS

Question:A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: ₹200 for the first day, ₹250 for the second day, ₹300 for the third day, etc., the penalty for each succeeding day being ₹50 more than for the preceding day. How much money the contractor has to pay as penalty, if he has delayed the work by 30 days?

Solution:

Since the penalty is increasing ₹50 per day we can use the formula of an arithmetic progression.The formula for sum of first n numbers of an arithmetic progression is:

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

where,

- S_n is the sum of first n numbers
- a is the first term
- n is the number of numbers
- d is the common difference between terms

Given,

- a=200(penalty for the first day)
- n=30(number of days delayed)
- d=50(increment in penalty for each day)

Now by substituting the given values in the formula,

$S_n = \frac{30}{2}[2 \times 200 + (30-1) \times 50]$

$S_n = 15[400 + 29 \times 50]$ = 15[400+1450]

$S_n = 15[1850]$

$S_n = 27750$

∴The total amount of money that the contractor has to pay as penalty for the delay is ₹27750