Assignment 2
AI1110

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The marginal cost function of x units of a product is given by MC = $3x^2 - 10x + 3$. The cost of producing one unit is ₹7. Find the total cost function and average cost function.

SOLUTION

Let us denote marginal cost function by M(x), cost function by C(x) and average cost function by A(x).

1) We know that,

$$\frac{dC(x)}{dx} = M(x) \tag{1}$$

$$A(x) = \frac{C(x)}{x} \tag{2}$$

2)

$$Given,\ M(x) = 3x^2 - 10x + 3 \tag{3}$$

$$So,\ C(x) = \int (3x^2 - 10x + 3).\, dx \tag{4}$$

$$C(x) = x^3 - 5x^2 + 3x + k \tag{5}$$

Where k is the constant of integration.
Also given C(1) = 7

$$So,\ 7 = 1 - 5 + 3 + k \tag{6}$$

$$k = 8 \tag{7}$$

Hence,

$$C(x) = x^3 - 5x^2 + 3x + 8 \tag{8}$$

$$A(x) = \frac{C(x)}{x} = x^2 - 5x + 3 + \frac{8}{x} \tag{9}$$