#### 1

# Assignment 2

## **AI1110: Probability and Random Variables**

## Indian Institute of Technology, Hyderabad

Chittepu Rutheesh Reddy cs21btech11014

### 21(b)[2019 ICSE 12<sup>th</sup>]:

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).

Symbol	Formula	Definition
M(x)	$3x^2 - 10x + 3$	Additional cost per unit when units are incremented
C(x)	$\int M(x) dx$	Total expenses in terms of units
A(x)	$\frac{C(x)}{x}$	It is cost per unit

TABLE I

Given,

$$M(x) = 3x^2 - 10x + 3 \tag{1}$$

$$\implies C(x) = \int (3x^2 - 10x + 3). dx$$
 (2)

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

Where k is the constant of integration.

Also given, C(1) = 7

$$\implies 7 = 1 - 5 + 3 + k \tag{4}$$

$$\therefore k = 8 \tag{5}$$

Hence,

$$C(x) = x^3 - 5x^2 + 3x + 8$$
(6)

$$A(x) = \frac{C(x)}{x} = x^2 - 5x + 3 + \frac{8}{x}$$
 (7)