

**ECONOMICS**  
**COURSE NO: ECO-102**  
**QUANTITATIVE TECHNIQUE – I (MATHEMATICS)**

**Unit I – Sets and Relations**

**1. Functions: types and its application in Economics**

- a) Supply Function
- b) Demand Function
- c) Cost Function
- d) Total Revenue Function
- e) Profit Function
- f) Market Equilibrium
- g) Break Even Point
- h) Production Function
- i) Consumption Function
- j) Saving Function

**2. Sets.**

- a) Concepts
- b) Operation of the Sets

**3. System of Equation**

- a) Degrees of an equation

**4. Inequalities in Market Equilibrium**

- a) Solving of demand and Supply equation

**Unit II – Number System**

**1. Uses of Numbers**

- a) Natural Number
- b) Integer
- c) Rational number
- d) Irrational Number
- e) Real Number

**2. Axiomatic properties of real number and completeness**

- a) Axiom of the field
- b) Axiom of order
- c) Axiom of completeness

**3. Complex number, Graphical representation of complex number**

- a) Law of Equality
- b) Law of Addition
- c) Law of Multiplication
- d) Law of Division
- e) Absolute Value

#### **4. Analytical Geometry**

- a) Properties of plane figures.
- b) Distance between two points
- c) Midpoint of line segment
- d) Division of a line
- e) Slope of a line
- f) Parabola
- g) The Circle
- h) Iso – Profit and Iso – Cost lines

### **Unit III – Differentiation**

#### **1. Rules of Differentiation.**

- a) Sum Rule
- b) Product Rule
- c) Quotient Rule

#### **2. Application of Derivatives**

- a) Marginal Revenue
- b) Average Revenue
- c) Total Revenue
- d) Marginal Cost
- e) Average Cost
- f) Total Cost
- g) Maxima and Minima

#### **3. Integration.**

- a) Rules of integration.
- b) Consumer surplus
- c) Producer surplus

### **Unit IV – Matrix and Determinants**

#### **1. Types of Matrix**

- a) Different types of Matrix
- b) Vector
- c) Operation of a Matrix

#### **2. Determinants**

- a) Computation of determinants
- b) Ad joint of a matrix
- c) Inverse of a matrix

#### **3. Solution of a Simultaneous Equation through Crammers Rule**

- a) Method of Solving simultaneous equation
- b) Crammer's rule

## **Unit V – Linear Programming**

### **1. Concept and formulation**

- a) Solution through Linear Programming Problem

### **2. Solution of LPP's through Graphs**

### **3. Input – Output Analysis**

- a) Leontref input-output table
- b) Technical Co-efficient Matrix