2. Answer any *four* of the following :   4×4=16

(a) Mathematically derive the relationship between average revenue, marginal revenue and price elasticity of demand.

(b) Evaluate :

$$\lim_{x \to 1} \frac{x^3 - 3x^2 + 2}{x^2 + 5x - 6}$$

(c) Write the assumptions of input-output analysis.

(d) Solve $Y_t = -7Y_{t-1} + 16$, $Y_0 = 5$.

(e) Draw the graph of $xy = 1$.

(f) Prepare a note on polynomial and rational functions.

3. (a) (i) Distinguish between equal set and equivalent set.

(ii) If $A = \{1, 4, 5, 7\}$ and $B = \{4, 9, 8, 10\}$, find $(A \cup B) \setminus (A \cap B)$.

(iii) Show the operations of sets with the help of Venn diagram.

Or

(b) (i) Write in short on the following with example :   3+3=6

(1) Ordered pairs

(2) Continuity of function

(ii) In a test, 60 percent of the students passed in Economics and 50 percent in Statistics. How many students passed in both the subjects?   5

(a) (i) Solve the input-output model $X(I - A) = F$ by using Cramer's rule. Given

$$A = \begin{bmatrix} 0.3 & 0.2 & 0.4 \\ 0 & 0.2 & 0.1 \\ 0.1 & 0.2 & 0.2 \end{bmatrix} \quad \text{and} \quad F = \begin{bmatrix} 400 \\ 600 \\ 500 \end{bmatrix}$$

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(ii) Distinguish between the following :   2+2=4

(1) Static and Dynamic input-output models

(2) Open and Closed input-output models

Or

(b) (i) Verify that the following matrix A is idempotent :   3

$$A = \begin{bmatrix} \frac{1}{6} & -\frac{1}{3} & \frac{1}{6} \\ -\frac{1}{3} & \frac{2}{3} & -\frac{1}{3} \\ \frac{1}{6} & -\frac{1}{3} & \frac{1}{6} \end{bmatrix}$$