

INDIRA UNIVERSITY, PUNE

SCHOOL OF COMMERCE & ECONOMICS- BSC ECO

Backlog Examination (2025 Pattern) April/ May – 2026 - Semester – I

Subject Name: Mathematics for Economics I
Subject Code: 25ECO102T

Max. Marks: 50
Time: 2:30 Hrs.

Instructions

- Calculators are allowed.

CO #	Cognitive Ability	Course Outcome
CO1	Remember	Able to recall the key historical events that shaped the evolution of modern banking and identify the core primary and secondary functions performed by banks.
CO3	Apply	Able to apply their knowledge of banking functions to demonstrate how banks facilitate financial transactions and execute the procedures necessary to complete bank account opening documentation.
CO4	Analyse	Able to analyze the relationships between the primary and secondary functions of banks and differentiate between the various types of bank accounts and their associated requirements

Q1.	Answer the following multiple choice questions: (6 Marks) 1. What is the cardinality of null set? a. Zero b. One c. Two d. Three 2. If $A = \{1, 2, 3, 4\}$ and $B = \{3, 4, 5, 6\}$, then Find $A \cap B$ is: a. $\{1, 2\}$ b. $\{3, 4\}$ c. $\{5, 6\}$ d. $\{1, 2, 5, 6\}$ 3. What is the derivative of $f(x) = x^2$ is: a. x b. $2x$ c. x^2 d. 2	CO1
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	4. What is the derivative of the total cost (TC) function with respect to quantity (Q) is called: a. Average cost b. Marginal cost c. Total revenue d. Profit 5. What is the application of Domar growth model?: a. First-order differential equation b. Second-order differential equation c. Difference equation d. Algebraic equation 6. How do we calculate the change in a variable, in a dynamic system ? a. Current value – Previous value b. Previous value – Current value c. Current value + Previous value d. Current value × Previous value	
Q.2.	Attempt the following compulsory question. (8 Marks) A firm's total cost function is: $C(Q) = Q^2 - 10Q + 50$ a. Find the output Q that minimizes total cost using the vertex . b. Find the minimum total cost. c. Interpret the economic meaning of the output level and minimum cost.	CO 2
Q.3. A.	Attempt any one question : (12 Marks) Solve x, y and z for $\begin{aligned} 3x + y - z &= 4, \\ x + 4y + 2z &= 9, \\ 2x - y + 3z &= 7 \end{aligned}$ (i) Write in matrix form (ii) Solve using Cramer's rule (iii) Verify solution	CO 3
B.	Solve the given 3 * 3 matrices and find transpose and Determinant of A and A^T $A = \begin{bmatrix} 1 & 2 & 5 \\ 2 & 6 & 3 \\ 5 & 3 & 1 \end{bmatrix}$	CO 3

Q4. A.	Attempt any one question : (12 Marks) Given, Demand function: $P = 45 - 0.5Q$ Equilibrium price: $P_0 = 32.5$, quantity: $Q_0 = 25$ 1. Find the consumer surplus (CS) using integration. 2. Draw the demand curve, mark P_0 and Q_0, and shade the CS area. 3. Provide a conclusion in 1–2 sentences and economic interpretation of CS.	CO 4
B.	Given, Revenue Maximization (Use Differentiation) A firm's total revenue function is: $TR(Q) = 50Q - Q^2$ 1. Using differentiation, find the output level that maximizes total revenue. 2. Compute the maximum revenue. Provide a conclusion in 1–2 sentences why it is a maximum	CO 4
Q5. A.	Attempt any one question : (12 Marks) Evaluate the following difference equations and comment on the nature of time path $X_{t+1} - 4X_t = 36$	CO 5
B.	Compare and discuss the conditions for convergence, divergence, and oscillation in the cobweb	CO 5
