

INDIRA UNIVERSITY, PUNE

SCHOOL OF COMMERCE & ECONOMICS-B.SC (ECO)

Term End Examination (2025 Pattern) December – 2025 - 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.	<p>Answer the following multiple choice questions: (1*6= 6 marks)</p> <p>1. Which type of number is $\sqrt{3}$?</p> <ol style="list-style-type: none"> Rational Irrational Natural Whole Number. <p>2. Let $A = \{1,3,5,7\}$ and $B = \{2,3,4,5\}$. Find $A \cup B$.</p> <ol style="list-style-type: none"> $\{1,2,3,4,5,7\}$ $\{3,5\}$ $\{1,3,5,7\}$ $\{2,4\}$ <p>3. What is derivative of $f(x) = 5x + 3$:</p> <ol style="list-style-type: none"> 5 3 $5x$ 0 <p>4. What is the area under Consumer surplus ?:</p> <ol style="list-style-type: none"> Under the demand curve and above the price line Above the demand curve Under the supply curve Between marginal cost and price 	CO1
-----	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

	<p>5. Which is the example of Cobweb model in economics :</p> <ol style="list-style-type: none"> First-order difference equation Second-order differential equation Integration model Algebraic model <p>6. How many previous periods are involved in Second-order difference equations ?:</p> <ol style="list-style-type: none"> Two previous periods One previous period No previous period Three previous periods 	
Q.2.	<p>Attempt the following compulsory question. (8 marks)</p> <p>Given, Total Profit function is $P(Q) = - 5Q^2 + 50Q + 40$</p> <ol style="list-style-type: none"> Find the profit maximizing output using vertex. Find maximum profit. Find break -even profit and interpret. 	CO 2
Q. 3 Q.3.A	<p>Attempt any one question : (12 marks)</p> <p>Solve x, y and z for $x + y + z = 6,$</p> $2x - y + z = 3,$ $x + 2y - z = 4$ <ol style="list-style-type: none"> Write in matrix form Solve using Cramer's rule Verify solution 	CO 3
Q3.B	<p>Find transpose and Determinant of A and A^T</p> $A = \begin{bmatrix} 6 & 2 & 1 \\ 4 & 5 & 9 \\ 1 & 3 & 2 \end{bmatrix}$	
Q. 4 Q4.A	<p>Attempt any one question : (12 marks)</p> <p>Given,</p> <p>Supply function: $P = 8 + 2Q$</p> <p>Equilibrium price: $P_0 = 24$, equilibrium quantity: $Q_0 = 8$</p> <ol style="list-style-type: none"> Find producer surplus. Graphically illustrate PS on the supply curve. Provide a short economic interpretation. 	CO 4
Q4.B	<p>Given, Profit Maximization (Use Differentiation)</p> <p>A firm's profit function is: $\pi(Q) = 100Q - 2Q^2$</p> <ol style="list-style-type: none"> Using differentiation, find the output Q that maximizes profit. Determine the maximum profit. Examine and Explain in 1–2 sentences why this is a maximum. 	

Q. 5	Attempt any one question :	(12 marks)	CO 5
Q5.A	Solve the following difference equations and evaluate and comment on the nature of time path: $\Delta y_t = y_t + 15$		
Q5.B	Compare first-order differential equation and a second-order differential equation? Explain in detail.		
