INTERNAL ASSESMENT (IA) - II

Date: - 05/12/2025

Max. Marks: 20   Duration: 1 Hour
Class: F.E.SEM-I
Name of the Course: **Applied Mathematics-I**
Branch: All

Instructions:
1. Question 1(i,ii,iii)is compulsory.
2. From Question 2 to 4 (Solve any Two)
3. Figures to the right of the question indicate full marks.
4. Assume the suitable data wherever necessary.
5. Illustrate your answers using neat diagrams wherever necessary.

Questions	Max Mks	Bloom's Taxonomy Level	Course Outcomes
Q1. i) If $z(x + y) = (x - y)$ find $\left(\frac{\partial z}{\partial x} - \frac{\partial z}{\partial y}\right)^2$	3	1	CO3
Q1.ii) Show that stationary values of $z = x^3 + 3xy^2 - 3x$ is (-1, 0)	3	2	CO4
Q1. iii) Reduce the following matrix to normal form and find its rank $A = \begin{bmatrix} 1 & 1 & 0 \\ 2 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$	4	2	CO5
From Question 2 to 4 (Solve any Two			
Q2. If $U = tan^{-1}\left[\frac{x^3+y^3}{x-y}\right]$, Prove that $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = 2\, sinu\, cos3u$	5	3	CO3
Q3.If y= a Cos(logx)+b Sin(logx) then show that $x^2 y_{n+2} + (2n + 1)xy_{n+1} + (n^2 + 1)y_n = 0$	5	2	CO4
Q4.Investigate for what value of λ and μ the equations $x + y + z = 6$ $x + 2y + 3z = 10$ $x + 2y + \lambda z = \mu$ have i) No Solution ii) Unique Solution iii) Infinitely many Solution	5	3	CO5