TAMIL NADU OPEN UNIVERSITY
Chennai - 15
School of Science

ASSIGNMENT

Programme Code No   : 131
Programme Name   : B.Sc., Mathematics
Course Code & Name   : BMSS-21, Differential Calculus
Batch   : AY 2022-23(1ʳˢᵗ year)
No.of Assignment   : One Assignment for Each 2 Credits
Maximum Marks   : 30(Average of Total NO .Of Assignments)

Assignment – I

Max. : 30 Marks

Answer any ONE of the question not exceeding 1000 words

1. (a) Find $\dfrac{d^2 y}{dx^2}$ if $y = (2x+1)\tan^{-1} x$

   (b) If $xy = ae^x + be^x$ prove that $x\dfrac{d^2 y}{dx^2} + 2\dfrac{dy}{dx} xy = 0$

2. (a) Investigate the maximum and minimum value of

   $4x^2 + 6xy + 9y^2 + 8x + 24y + 4$

   (b) Using Lagrange's Multipliers nd the maximum and minimum value of

   $f(x, y, z) = x + y + z$ subject to $\dfrac{1}{x} + \dfrac{1}{y} + \dfrac{1}{z} = 1$

3. (a) Find the envelope of the family of lines $\dfrac{x}{a} + \dfrac{y}{b} = 1$ where a & b the parameters a and b are

   connected by the relation $a^n + b^n = c^n$

   (b) Find the radius of curvature of the curve $xy^2 = a^3 x^3$ at the point $(a,0)$.