BAHRIA UNIVERSITY, (Karachi Campus)

Department of Software Engineering

Quiz 4 - Fall 2022

COURSE TITLE:	**Calculus and Analytical Geometry**	COURSE CODE:	**GSC-110**
Class:	**BSE-I (B)**	Shift:	**Morning**
Course Instructor:	**MR. DANIYAL UR REHMAN**	Time Allowed:	**20 min**
Date:	**10-1-2023**	Max. Marks:	**2.5 Marks**

[CLO2: 2.5 Marks]

Question No. 1

a. Illustrate the value of c which is guaranteed by Rolle's Theorem foe the function $f(x) = (x-3)(x+1)^3, [-1,3]$

b. Illustrate the value of c which is guaranteed by Mean value Theorem for the function $f(x) = x^3 + 2x, [-1,1]$

c. If $y = f(x) = log(x + \sqrt{x^2+1})$, show that $(1+x^2)\frac{d^2y}{dx^2} + x\frac{dy}{dx} = 0$

d. predict the first four term of maclaurin series for the function $f(x) = e^{-x}$

a) $f(x) = (x-3)(x^3+3x^2+x+1) = x^4+3x^3+x^2+x$

$-3x^3-9x^2-3x-3 = x^4-8x^2-2x-3$

$f'(x) = 4x^3-16x-2$

$f'(c) = 4c^3-16c-2$

$c = 2.05, -0.12, -1.9$

$\boxed{c = 2.05, -0.12}$

b) $f(b) = f(1) = 3$

$f(a) = -1+2 = 1$

$= \frac{3-1}{1+1}$

$= \frac{2}{2}$

$3x^2+2 = 1$

$3x^2 = -1$