COMSATS University Islamabad
Department of Computer Science
Terminal Exam, Spring 2023

Class: BCS 2-R
Course Title: Calculus and Analytic Geometry
Max. Marks: 50

Instructor: Dr. M. USMAN
Course Code: MTH104
Max. Time: 3 Hour

Instructions: Attempt all questions. Please don't write anything on question paper.

Question #1: Graph the equation $|x| + |y| = 1 + x$. [Mark 05]

Question #2: If $\lim_{x \to 2} \frac{g(x)-5}{x-2} = 4$, then find $\lim_{x \to 2} g(x)$ and $g(x)$. [Mark 05]

Question #3: Use first and second derivative to sketch the general graph of $f(x) = \frac{x^2-4}{x^2-3}$.

[Mark 10]

Question #4: Evaluate the derivative of $y = (\sin x)^{\sqrt{x}}$ with respect to x. [Mark 05]

Question #5: Evaluate $\frac{dy}{dx}$ from the equation $\sinh(y) = \sqrt{x}$. [Mark 05]

Question #6: Find the area of the region enclosed by the curves $y^2 = 4x + 4$, and $y = 4x - 16$. [Mark 05]

Question #7: Find the volume of the solid generated by revolving the region bounded by the parabola $y = x^2$ and the line $y = 1$ about
a) the line $y = 2$
b) the line $y = -1$. [Mark 10]

Question #8: Evaluate the following integral. [Mark 05]

$$\int \frac{y^4 + y^2 - 1}{y^3 + y} dy$$