COMSATS University Islamabad

Lahore Campus

Mid Term Exam– Fall 2021

Course Title:	Calculus and Analytical Geometry	Course Code:	MTH104	Credit Hours:	3(3,0)
Course Instructor/s:	Dr. Muhammad Kamran Siddiqui	Program Name:	BCS		
Semester:	[redacted]	A, B, C	Date:	16-11-2021	
Time Allowed:	**90 minutes**	**Maximum Marks:**		25	
Student's Name:	[redacted]	Reg.No	[redacted]		

Important Instructions / Guidelines:

- Attempt all questions

Objective

Note: Attempt all Short questions (5*2=10)

Question: 1. Solve the inequalities and show their solution sets on real line

$$\left|3-\frac{1}{x}\right|<5$$

Question: 2. Find the domain of the following function $f(x)=\sqrt{9-x^2}$

Question: 3. Check the continuity of function.

$$f(x)=\begin{cases} x^2-4, & if \quad x\neq 2 \\ 2-x, & if \quad x=2 \end{cases}$$

Question: 4. Evaluate the limit. $\underset{x\to 0}{Limit}\left(\frac{Sin5x}{x}\right)$

Question: 5. Find the second derivative of the function f(x), at x=2, if

$$f(x)=2x^3+9x^2+11x+14$$

Subjective

Note: Attempt all long questions. (3*5 = 15)

Question: 6. Find $\frac{dy}{dx}$ of the following implicit function and then find equation of tangent line and normal line to the curve at point $(\mathbf{0}, \boldsymbol{\pi})$

$$x^2 cos^2 y - siny = 0$$

Question: 7. Determine the intervals in which function is either positive or negative if

$$f(x) = 8x^2 - 2x - 3$$

Question: 8. Solve by Substitution method

$$\int \frac{(\sqrt{t} - 1)^2}{\sqrt{t}} dt$$