MT119 Calculus and Analytical Geometry

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Course Instructors

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Roll No   Section

Guidelines for Submission:

1. You should submit only one PDF document. If the document is formed from scanned image then it should be clearly visible and all pages should be in a sequence.

2. You must submit your solution before due time via **Google Classroom**. Submissions submitted after the due time shall not be considered.

3. If you don't finish every part of a question, don't worry! You can still submit what you've done to get marks based on your efforts.

4. In case of copied or plagiarized solutions in exam Or If a student provided help to another student during exam both will be awarded "F" grade and it will affect the student CGPA.

5. Viva of any student can be conducted by the instructor after conducting an online exam in case of any doubt.

6. This document should be submitted through LMS (**Google Classroom**). But in worst case, you can email it within the deadline.

Question # 1	4+4+7=15 Points

Differentiate the following

(i)

$$x^2 y + x \sin y + \frac{y}{x} = 1$$

(ii)

$$y = x^2 \ln x + xe^{-x}$$

(iii)

$$y = \frac{\sqrt{a^2 + x^2} - \sqrt{a^2 - x^2}}{\sqrt{a^2 + x^2} + \sqrt{a^2 - x^2}}$$

Question # 2	10 Points

Find the equation of tangent line to the curve

$$y = \frac{5x}{2x^2 + 4}$$

At a point $\left(\sqrt{3}, \frac{\sqrt{3}}{2}\right)$.

Question # 3	5+4+3=12 Points

Consider the following function

$$f(x) = 8x^3 + 9x^2 + 3x - 4$$

   a.   Find points of inflections.

   b.   Find the interval on which given curve is concave up and concave down.

   c.   Find the local extreme values of given function.

Question # 4	2+2+4=8 Points

Is the given function satisfies all the hypothesis of Mean Value theorem, if yes, then find all the numbers c that satisfies the conclusion of Mean Value theorem.

$$y = \ln(2x + 1)$$