Lahore Campus

Calculus & Analytical Geometry

(MT1003)

Date: 5th November, 2024

Course Instructor(s)

Dr. Mazhar Hussain (Moderator)

Dr. Sonia Hanif

Dr. Komal Hassan

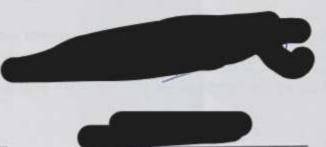
Dr. Ayesha Razzaq

Dr. Atta Ullah

Mr. Abdul Hafeez

Mr. Muhammad Adeel

Ms. Eesha Meer



Roll No.

Section



Sessional-II Exam

Total Time (Hrs.):

Total Questions:

Total Marks:

Do not write below this line

- > Attempt all the questions in the given order
- Write question number on your answer with bold faced marker.

CLO #4: Apply the concept of differentiation in real life problem

- 1. The base of a right triangle is decreasing at the rate of 5 in/sec and the height of the right triangle is increasing at the rate of 7 in/sec. At what rate is the triangle's
 - a) hypotenuse changing
 - b) perimeter changing
 - c) area changing

when base is 8 inches and height is 6 inches.

[7]

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CLO #5: Curve sketching using extrema theory

- 2. The first derivative of a function y = f(x) is given
 - a) At what points, if any, does the graph of f have a local maximum, local minimum, or inflection point?
 - b) Sketch the general shape of the graph.

$$y' = x(x^2 - 12)$$

[10]

CLO #4: Apply the concept of differentiation in real life problem



3. A manufacturer needs to make a cylindrical can that will hold 1.5 liters of liquid.

Determine the dimensions of the can that will minimize the amount of material used in its construction.

[10]

CLO #6: Riemann sum, evaluation of definite & amp; indefinite integral and their applications to compute lengths of curves / area of regions / volume of solids.

- 4. Let $f(x) = 2x x^3$ is defined over the interval [0, 1].
 - 3) Find a formula for the Riemann sum by dividing the interval into n equal subintervals.
 - b) Take a limit of the sum to calculate the area under the curve on the interval.

[10]

CLO #6: Riemann sum, evaluation of definite & amp; indefinite integral and their applications to compute lengths of curves / area of regions / volume of solids.

5. Determine the area bounded by the regions $g(y) = 3 - y^2$ and x = -1.

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[8]

Good Luck