NED UNIVERSITY OF ENGINEERING & TECHNOLOGY, KARACHI
FSCS (CS & IT) , SPRING SEMESTER 2024

MT-171 DIFFERENTIAL & INTEGRAL CALCULUS

ASSIGNMENT (CLO 2 – 10 marks)

Submission Date: on or before 28-June-2024

Q1. Sketch the graph of the function using tools of differential calculus.

(a) $f(x) = 3x^4 + 9x^3 + 6x^2$ (b) $f(x) = \frac{x-2}{x^2-4x+3}$

Q2. (a) Evaluate $(i)\ \int_0^\infty x^4 e^{-x^2} dx$ $(ii)\ \int_0^1 (1-x^3)^{-1/2}$

(b) Derive Reduction Formula to evaluate $\int cos^n x\ dx$ and use it to evaluate $\int_{-\pi/2}^{\pi/2} cos^7 3x\ dx$

Q3. An international airline has a regulation that each passenger can carry a suitcase having the sum of its width, length, and height less than or equal to 129 cm. Find the dimensions of the suitcase of maximum volume that a passenger can carry under this regulation.

Q4. Find the centroid of the triangular lamina having vertices 90,0) , (2,0) and (1,1) using double integration.

Q5. Prove that the fluid motion in a pipe is given by $\vec{v} = (ysin\ z - sinx\ )i + (xsinz + 2yz)j + (xycosz + y^2)k$ is irrotational.

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