

National University of Computer & Emerging Sciences, Karachi
Department of Electrical Engineering
Spring -2023



Sessional-I, 28 feb 2023, 10:00 am – 11:00 am

Course Code: MT-1001	Course Name: Applied calculus
Instructors Name: Mr Nadeem Khan	
Student Roll No:	Section No:

Instructions:

- Read each question completely before answering it. There are 5 questions and 2 pages.
- Do not write anything on question paper. Return the question paper.
- Graphical calculator is not allowed.

Time: 01 Hours

Max.Marks: 30 points

Q.1: _____ (CLO1) [5 × 2 = 10]

Evaluate (any 2)

a) $\int x^2 e^x dx$
b) $\int \ln x dx$

c) $\int \frac{x^2}{x^2-1} dx$

Q.2: _____ (CLO3) [5]

Calculate the area between the curves $y = x^2$ and $y = x + 2$.

Q.3: _____ (CLO1) [3 + 2 = 5]

(a). For what value of 'k' so that $f(x)$ is continuous

$$f(x) = \begin{cases} 7x - 2, & x \leq 1 \\ kx^2, & x > 1 \end{cases}$$

(b). Find formulas for $f \circ g$ and $g \circ f$ if $f(x) = \sqrt{x-3}$, $g(x) = \frac{x+1}{1-x}$

Q.4: _____ (CLO1) [2.5 × 2 = 5]

a) Find $\frac{dy}{dx}$ $y = (\ln x)^{\tan x}$

b) Find $\frac{dy}{dx} \Big|_{x=2}$ $y^3 x^3 - 4 = 0$

Q.5:

(CLO1)

[5]

Evaluate the following limit using given graph.

(i) $\lim_{x \rightarrow -2^-} f(x)$

(ii) $\lim_{x \rightarrow -2^+} f(x)$

(iii) $\lim_{x \rightarrow 0^-} f(x)$

(iv) $\lim_{x \rightarrow 0^+} f(x)$

(v) $\lim_{x \rightarrow 4^-} f(x)$

