CHANDIGARH ENGINEERING COLLEGE CGC LANDRAN Building Careers. Transforming lives.	**CHANDIGARH ENGINEERING COLLEGE-CGC** **Department of Applied Sciences**

Assignment No 1 **Max. Marks: 30**

Subject and Subject code: Mathematics –I/ BTAM--101-23

Semester 1^{st} (CSE/IT/AI-DS/AI-ML/IOT/DS/ECE/ME/RAI/E&CE)

Date on which assignment given: 13/08/2024 Date of submission of assignment: 28/08/2024

Course Outcomes:
Students will be able to:

CO1	Examine the convergence and divergence of sequences and series.
CO2	Apply the concept of Proper integral to find length , surface area and volume of revolution of the curves and to deal with discontinuous functions using Improper integral.
CO3	Use the concepts of partial differentiation to expand , estimate and find the extreme values of Multivariable Functions .
CO4	Evaluate area and volume of the surfaces using the concept of double and triple integration.

Bloom's Taxonomy Levels

L1 – Remembering, L2 – Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 - Creating

	Assignment related to COs	Bloom's Taxonomy Level	Relevance to CO No.
	SECTION - A (2Marks Each)		
Q1.	Explain the concept of Implicit and Explicit functions.	**L-2**	**CO-3**
Q2.	Define Oscillatory series with an example.	**L-1**	**CO-1**

Q3.	Show that the geometric series $\sum_{n=0}^{\infty} r^n$, where r is any real number such that $\|r\|<1$ is convergent.	**L-3**	**CO-1**
Q4.	What are the advantages and disadvantages of Lagrange's method of undetermined Multipliers?	**L-2**	**CO-3**
Q5.	Use the limit comparison test to determine whether the series $\sum(\sqrt[3]{n^3-1}$ - n) is convergent or divergent.	**L-3**	**CO-1**
SECTION – B (4 Marks Each)			
Q6.	Test the convergence of the series $\frac{x}{1.2}+\frac{x^2}{3.4}+\frac{x^3}{5.6}+\cdots\infty$, where x > 0	**L-4**	**CO-1**
Q7.	If $u=\sin^{-1}\frac{x+y}{\sqrt{x}+\sqrt{y}}$, prove that $x^2\frac{\partial^2 u}{\partial x^2}+2xy\frac{\partial^2 u}{\partial x\partial y}+\frac{\partial^2 u}{\partial y^2}=-\frac{\sin u\cos 2u}{4\cos^3 u}$	**L-5**	**CO-3**
Q8.	If $u=f(r)$ where $r^2=x^2+y^2$, show that $\frac{\partial^2 u}{\partial x^2}+\frac{\partial^2 u}{\partial y^2}=f''(r)+\frac{1}{r}f'(r)$	**L-4**	**CO-3**
Q9.	A rectangular box open at the top, is to have volume of 32 cubic metres. Find the dimensions of the box requiring least material for its construction.	**L-5**	**CO-3**
Q10.	Test whether the series is conditionally convergent or not $\sum_{n=1}^{\infty}\frac{(-1)^{n-1}n}{n^2+1}$	**L-6**	**CO-1**