GALGOTIAS UNIVERSITY

ADMISSION NUMBER												

School of Basic Sciences

Bachelor of Science Honours in Physics
Mid Term Examination - Nov 2023

Duration : 90 Minutes
Max Marks : 50

Sem III - C1UD302T - Mathematical Physics II

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	State the condition for Fourier series to be integrated term wise.	K2	(2)
2)	Identify whether the function is even or odd, (i) f(x)= Sin3x (ii) f(x)= x Cos x, and (iii) f(x)= x3- 4x	K1	(3)
3)	Obtain a Fourier series of function given as f(x) = 3 - 2x , -π < x < π	K2	(4)
4)	Expand the given function in cosine series f(x) = e^{-x} , $0 < x < 1$	K2	(6)
5)	Explain the importance of Fourier Series in signal systems	K3	(6)
6)	Analyze the Fourier series representing the function as, $f(x) = \begin{cases} 0, & -\pi < x < 0 \\ 1, & 0 \leq x < \pi \end{cases}$	K3	(9)
7)	Obtain the complex form of Fourier series of function, f(x) = x2 in the interval [-1,1].	K4	(8)
8)	Find Fourier series of a function $f(x) = \begin{cases} 0, & -\pi < x < 0 \\ sinx, & 0 \leq x < \pi \end{cases}$ hence prove that $\frac{\pi}{4} = \frac{1}{2} + \frac{1}{1.3} - \frac{1}{3.5} + \frac{1}{5.7} - \frac{1}{7.9} + \cdots \ldots \ldots \ldots$	K4	(12)

OR

	Obtain complex form of Fourier series for the given function f(x) = e^(-x) , in the interval -π < x < π	K4	(12)