Department of Mathematics
Kalinga Institute of Industrial Technology
Deemed to be University, Bhubaneswar
Transforms and Numerical Methods (MA-11002)
Assignment-II
B.Tech., Session-2022-2023

F.M.=05

Answer All Questions.

Q.1 Find the Fourier series expansion of the following function (period 2π).

$$f(x) = \begin{cases} x, & \text{if } -\pi < x < 0 \\ \pi - x, & \text{if } 0 < x < \pi \end{cases}$$

Q.2 Find the Fourier cosine and sine series of the given function.

$$f(x) = \begin{cases} 0, & \text{if } 0 < x < 2 \\ 1, & \text{if } 2 < x < 4 \end{cases}$$

Q.3 Represent the function $f(x) = \begin{cases} e^{-x}, & \text{if } 0 < x < a \\ 0, & \text{if } x > a \end{cases}$ as Fourier cosine integral.

Q.4 Find the Fourier sine and cosine transforms of $f(x) = e^{-2x}$ using transforms of derivatives.

Q.5 Find the Fourier transform of the given function.

$$f(x) = \begin{cases} xe^{-x}, & \text{if } x > 0 \\ 0, & \text{if } x < 0 \end{cases}$$