JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B.Tech-III Semester (ECE)

COURSE CODE (CREDITS): 23B11EC311 (4)   MAX. MARKS: 25

COURSE NAME: FUNDAMENTALS OF SIGNALS & SYSTEMS

COURSE INSTRUCTORS: Dr Rajiv Kumar   MAX. TIME: 1 Hour 30 Minutes

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required

for solving problems

Q.No	Question	CO	Marks
Q1	What do you mean by the convolution? What is graphical approach of finding convolution? Explain with giving one example.	CO-2	5
Q2	Try to attempt the following parts: (a) What do you mean by the principle of duality in Fourier Transform (b) What do mean by the integration, differentiation, convolution property (c) Draw the magnitude and phase of a_k,s with respect to k	CO-3	5
Q3	Suppose that the signal $e^{j\omega t}$ is applied as the excitation to a linear, time-invariant system that has an impulse response $h(t)$. By using the convolution integral, show that the resulting output is $H(\omega)e^{j\omega t}$. Where; $H(\omega) = \int_{-\infty}^{\infty} h(\tau)e^{-j\omega\tau}\,d\tau$	CO-3	5

Q4	Find the Fourier series coefficients for each of the following signals: (a) $x(t) = \sin\left(10\pi t + \dfrac{\pi}{6}\right)$ (b) $x(t) = 1 + \cos(2\pi t)$ (c) $x(t) = [1 + \cos(2\pi t)]\left[\sin\left(10\pi t + \dfrac{\pi}{6}\right)\right]$	CO-3	5
Q5	Find the Fourier transform of each of the following signals and sketch the magnitude and phase as a function of frequency, including both positive and negative frequencies. $(a)\delta(-5)$ $(b)e^{-at}u(t)$	CO-3	5