School of Engineering

B.TECH Electronics and Communication Engineering
Mid Term Examination - Nov 2023

Duration : 90 Minutes
Max Marks : 50

Sem III - G2UC302T - Signals and Systems

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) Classify Continues-time signals, citing suitable examples. — K2 (2)

2) Define continues time unit step signal with it's mathematical and graphical representaion. — K1 (3)

3) Explain the condition for linearity of a system using suitable examples. — K2 (4)

4) Illustrate whether the following signals are energy signals or power signals. — K2 (6)

Hence find energy or power of the signal.

(i) $x[n] = \left(-\frac{1}{4}\right)^n u(n)$ 25.1

(ii) f(t)=cos(t)+sin(t)………….25.2

5) Identify the system described by the equation is linear and time invariant: y(t) = 2x(t) + 4 — K3 (6)

6) Make use of total power and total energy relation to find out that the following signals are energy, power or neither: (i) x(t) =2 u(t) - 2u(t - 2) and (ii) x(t) = t.u(t) — K3 (9)

Estimate the Discrete-time Fourier transform of x(n), where

X[n] = 1 ; 0 ≤ n ≤ 4

    =   0 ; otherwise   ……………37.1

7) Using graphical method, Determine the output y(t) for the LTI system whose impulse response is h(t) = u(t) and input x(t)= u(t). — K4 (8)

8) Examine the continues time Fourier transform of the following signal and draw its magnitude and phase response. : — K4 (12)

$x(t) = e^{-2t}u(t)$ **…............43.1**

OR

Examine the continues time Fourier transform of the following signal and draw its magnitude and phase response. :
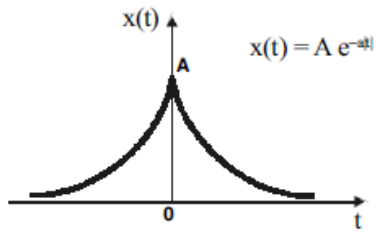
$x(t) = e^{-2|t|}$ 44.1

Fig. 44.1 Signal x(t)