VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.: 24BEC0348

SCHOOL OF ELECTRONICS ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

SLOT: B1+TB1

Programme Name & Branch	**: B. Tech -ECE and BML**
Course Code and Course Name	**: BECE202L Signals and Systems**
Faculty Name(s)	**: Dr. KARTHIKEYAN, Dr. RAJESH N, Dr. NAWAZ SHAFI, Dr. BIJAYLAXMI DAS, Dr. ASHISH P, Dr. JAGANA BIHARI PADHY**
Class Number(s)	**: VL20252601004448,2647,2648,2650,3478,3489**
Date of Examination	**: 18-08-2025**
Exam Duration	**: 90 minutes**

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- **Course Outcomes**
  1. Differentiate between various types of signals and understand the implication of operations on signals.
  2. Understand terms like causal, dynamic, linear, time invariant and stability of systems; also compute impulse response of both continuous-time and discrete-time systems.

Q. No	Question	M	CO	BL
1.	A discrete time signal x[n] is given as x[n] = {3 2 1 **0** 1 2 3} ▲ Sketch each of the following signals: a. $x[n]u[1-n]$ b. $x[n]\{u[n+2]-u[n]\}$ c. $x[n]\delta[n-1]$ d. $x[1-2n]$	10	1	2
2.	Find if the following signals are energy/power/neither energy or power signals: i. $x[n] = e^{j\left[\left(\frac{\pi}{3}\right)n+\left(\frac{\pi}{2}\right)\right]}$ ii. $x[n] = (j)^n + (j)^{-n}$	10	1	2
3.	Let the input output relationship of an LTI system described by the following equation $y(t) = \int_{-\infty}^{t} e^{-(t-\tau)} x(\tau - T)d\tau$; T is a + ve constant a) Compute the impulse response of this system. b) Compute the step response of this system.	10	2	3

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4.	A) Let a system S be defined by the following input-output relationship: $y(t) = x(t)\,x(-t)$. Determine whether the system is: Linear, Memoryless, and Time-Invariant B) Determine the range of values of "a" and "b" for the stability of LTI system with impulse response. $h(t) = e^{at}u(t) + e^{-bt}u(t)$	10	2	2
5.	Let the continuous-time LTI system have an impulse response $h(t) = e^{-2(t-2)}u(t-2)$ and an input signal: $x(t) = u(t) - u(t-4)$. Compute and sketch the output y(t).	10	2	3

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