



VIT

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

REG.NO.: 25BE10242

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

SLOT:C1

Programme Name & Branch : B.Tech (ECE & BML)
Course Code and Course Name : BAECE101-Signals and Systems
Faculty Name(s) : Dr. G. Ramachandra Reddy, Dr.J.Valarmathi,
Dr. Malaya Kumar Hota, Dr. Christopher Clement J,
Dr. Anantha Krishna Chintanpalli

Class Number(s) : VL2025260105979/5981/5983/5985/5987

Date of Examination : 19/08/2025

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 (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)

Co1- Illustrate the mathematical representations and classifications of continuous and discrete-time signals and systems

Q. No	Question	M	CO	BL
1.	The signal $x[n] = \{0, 0, -3, -1, \underline{2}, 4, 0, 3\}$, where underlined indicates $n = 0$. Find and sketch the following signals: i) $x[-n + 3]$ ii) $x[2n + 3]$ iii) $x[4n]$ iv) $x[-2n - 2]$	10	1	3
2.	a) Check whether the following signals are periodic or non-periodic. If periodic, compute its fundamental period: $x(t) = \cos \frac{\pi}{3}t + \sin \frac{\pi}{4}t$ b). Compute the signal energy and power of the following signals. Determine whether it is an energy or power or neither of them. i). $x(t) = e^{j(2t+\pi/4)}$ ii). $x(t) = e^{-at}u(t), a > 0$	4+6	1	3
3.	The system given below either have input $x(t)$ or $x[n]$ and output $y(t)$ or $y[n]$, respectively. Determine whether each of the following system is (i) memoryless (ii) causal (iii) linear (iv) time-invariant (v) stable. Justify your answers. (a) $y(t) = x(t - 2) + x(2 - t)$ (b) $y[n] = x[n]u[n]$	5+5	1	3



VIT

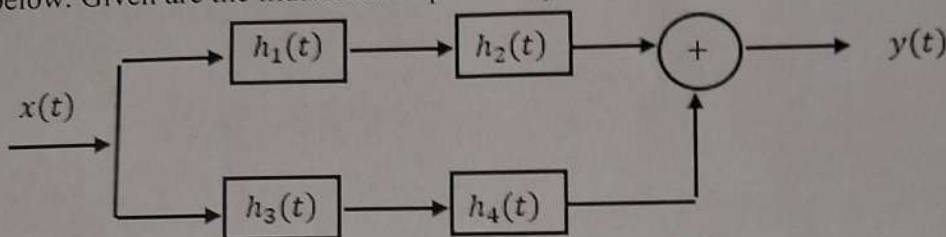
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4. The continuous-time LTI system, with $x(t)$ as input and $y(t)$ as output, is shown below. Given are the individual impulse responses of the LTI sub-systems



$$h_1(t) = \delta(t - 1) \quad h_2(t) = e^{-2t}u(t) \quad h_3(t) = e^{-t}u(t) \quad h_4(t) = \delta(t)$$

- a) Compute the overall impulse response of this system.
b) Compute the overall step response of this system.

5. Let $x(t) = e^{-at}u(t)$, and $h(t) = e^{-bt}u(t)$. Find the convolution of these signals for the following two cases: i) $a = b = 2$, ii) $a \neq b$ such that $a=2$ and $b=3$. Sketch the outputs.

5+5

1

3

4+6

1

3
