Continuous Assessment Test (CAT) – I AUGUST 2025

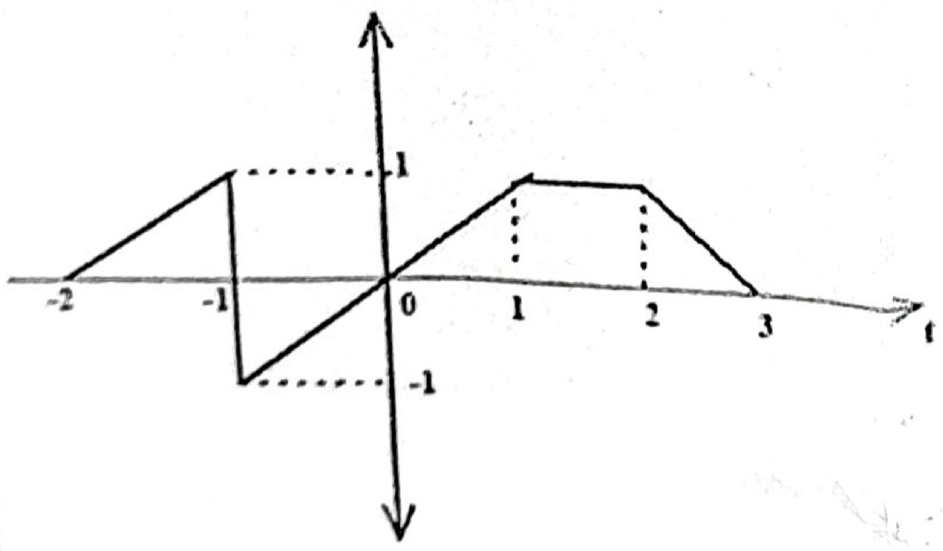
Programme	:	B.TECH (ECE, MECHATRONICS)	Semester	:	FS 2025-26
Course Code & Course Title	:	BECE202L & Signals and Systems	Class Number	:	CH2025260100328 CH2025260100334 CH2025260100330 CH2025260100332
Faculty	:	Dr.A. Brintha Therese, Dr. Usha Rani S, Dr. Ralph Samuel Thangaraj, Dr.Ranjeet Kumar K	Slot	:	A1
Duration	:	90 Minutes	Max. Mark		50

General Instructions:

Write only your registration number on the question paper in the box provided and do not write other information

- Use statistical tables supplied from the exam cell as necessary
- Use graph sheets supplied from the exam cell as necessary
- Only non-programmable calculator without storage is permitted

Answer all questions

Q. No	Sub Sec.	Description	Marks	CO	BT Level
1.		Represent the following signal with the help of step and ramp signals. 	5	CO1	L3
2	a)	Given $x(t) = e^{-t} u(t)$, find $y(t) = x(t - 3)$ and sketch both x(t) and y(t).	3	CO1	L3
	b)	If $x[n] = \{2, 1, 0, -1\}$ for $-1 \leq n \leq 2$, find $y[n] = x[-n+2]$	2	CO1	L3
3		Determine the power and energy of the discrete time signal, x[n] defined as: $x[n] = \sin \frac{\pi}{6} n$	5	CO1	L3

4		Classify the continuous signal x(t) given by: $x(t) = 10\cos(5t).\cos(10t)$ as a periodic or aperiodic signal. If it is periodic, determine its fundamental period.	5	CO1	L3
5		Check if the signals $x(t) = e^{j2\pi t}$ and $y(t) = e^{-j4\pi t}$ are orthogonal over the interval $t \in [0,1]$.	5	CO1	L3
6	a)	Determine whether the system listed below are casual and stable $y(n) = 3^n u(-n)$	5	CO2	L3
	b)	Check whether following system is linear time invariant system $\frac{dy(t)}{dt} + 2t^2 y(t) = t\,x(t)$	5	CO2	L3
7.		There are two systems cascaded in series, with transfer functions given by $h_1(t) = e^{-2t}\,u(t)$; $h_2(t) = \delta(t) - 2\,e^{-t}\,u(t)$ The input is given by $x(t) = u(t) - u(t-1)$ Find i)The overall transfer function of the system (5Marks) ii)The output y(t) for the given input x(t) (5 Marks)	10	CO2	L3
8		Find the auto-correlation of the signal given below: $x(t) = \begin{cases} 1, & 0 \le t \le 1 \\ 0, & \text{otherwise} \end{cases}$	5	CO2	L3

**********All the best **********