

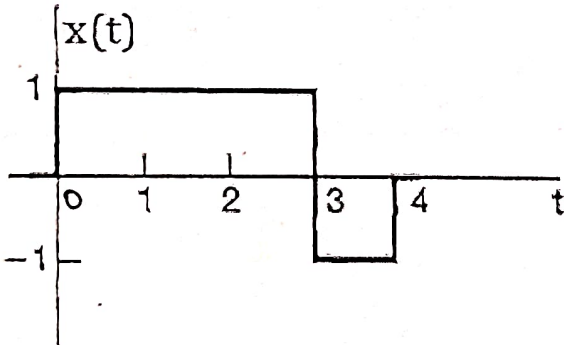
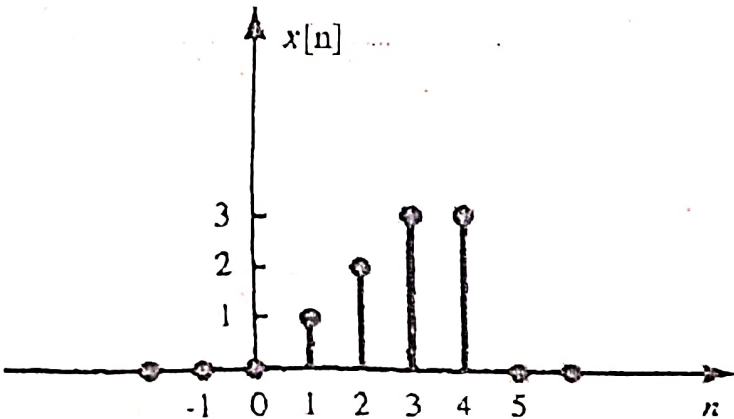
**SCHOOL OF ELECTRICAL ENGINEERING**  
**CONTINUOUS ASSESSMENT TEST - I**  
**FALL SEMESTER 2025-2026**

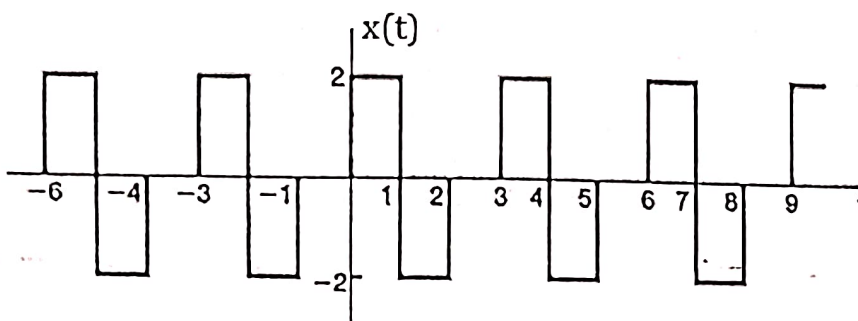
**SLOT: B2+TB2**

|                             |                                         |
|-----------------------------|-----------------------------------------|
| Programme Name & Branch     | : B. Tech EEE/EIE                       |
| Course Code and Course Name | : BEEE204L, Signals and Systems         |
| Faculty Name(s)             | : Mathew M. Noel, Maddela Chinna Obaiah |
| Class Number(s)             | : VL2025260101031, VL2025260101032      |
| Date of Examination         | : 18 August 2025, 2:00 PM – 3:30 PM     |
| 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 – Analyze, 5 – Evaluate, 6 – Create)
- Course Outcomes:
- CO1: Perform signal transformations on continuous and discrete - time signals and systems.
- CO2: Apply convolution integrals and convolution sums to obtain response of LTI systems.
- CO3: Apply frequency domain techniques to obtain steady state response of the continuous and discrete time LTI system.

| Q. No | Question                                                                                                                                                                                                                                                                                                                                                                                                                       | Marks | CO | BL |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|----|
| 1     | <p>Consider the signals <math>x(t)</math> and <math>x[n]</math> given below.</p> <p>i) Neatly sketch <math>x(2t - 1)</math> for <math>x(t)</math> shown below:</p>  <p>ii) Neatly sketch <math>x[4n + 1]</math> for <math>x[n]</math> shown below:</p>  | 5     | 1  | 3  |
|       |                                                                                                                                                                                                                                                                                                                                                                                                                                | 5     |    |    |

|    |                                                                                                                                                                                                                                               |    |   |   |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|---|
| 2a | <p>Determine if the following signals are periodic and if periodic determine the fundamental period:</p> <p>i) <math>x[n] = 2\cos\left(\frac{11\pi n}{15}\right)</math></p> <p>ii) <math>x(t) = \cos(t) + \cos(5t)</math></p>                 | 3  |   |   |
| 2b | <p>Plot the odd and even parts of the signal <math>x(t) = u(t) - u(t - 1)</math>. Where <math>u(t)</math> is the unit step signal.</p>                                                                                                        | 3  | 1 | 3 |
| 3  | <p>Determine whether the system defined by <math>y[n] = x^2[2n + 2]</math> is</p> <p>(i) Memoryless<br/>(ii) Linear<br/>(iii) Time-invariant<br/>(iv) Causal<br/>(v) BIBO stable</p> <p>Provide justification for your answers.</p>           | 4  |   |   |
| 4  | <p>Convolve the signals <math>x_1[n]</math> and <math>x_2[n]</math> using the graphical convolution method:</p> <p><math>x_1[n] = \{1, 3, 3, 1\}</math> <math>x_2[n] = \{1, 2, 1\}</math></p> <p>The signals start at <math>n = 0</math>.</p> | 10 | 2 | 3 |
| 5  | <p>Determine the Complex Exponential Fourier series representation of the signal shown below:</p>                                                         | 10 | 3 | 4 |