



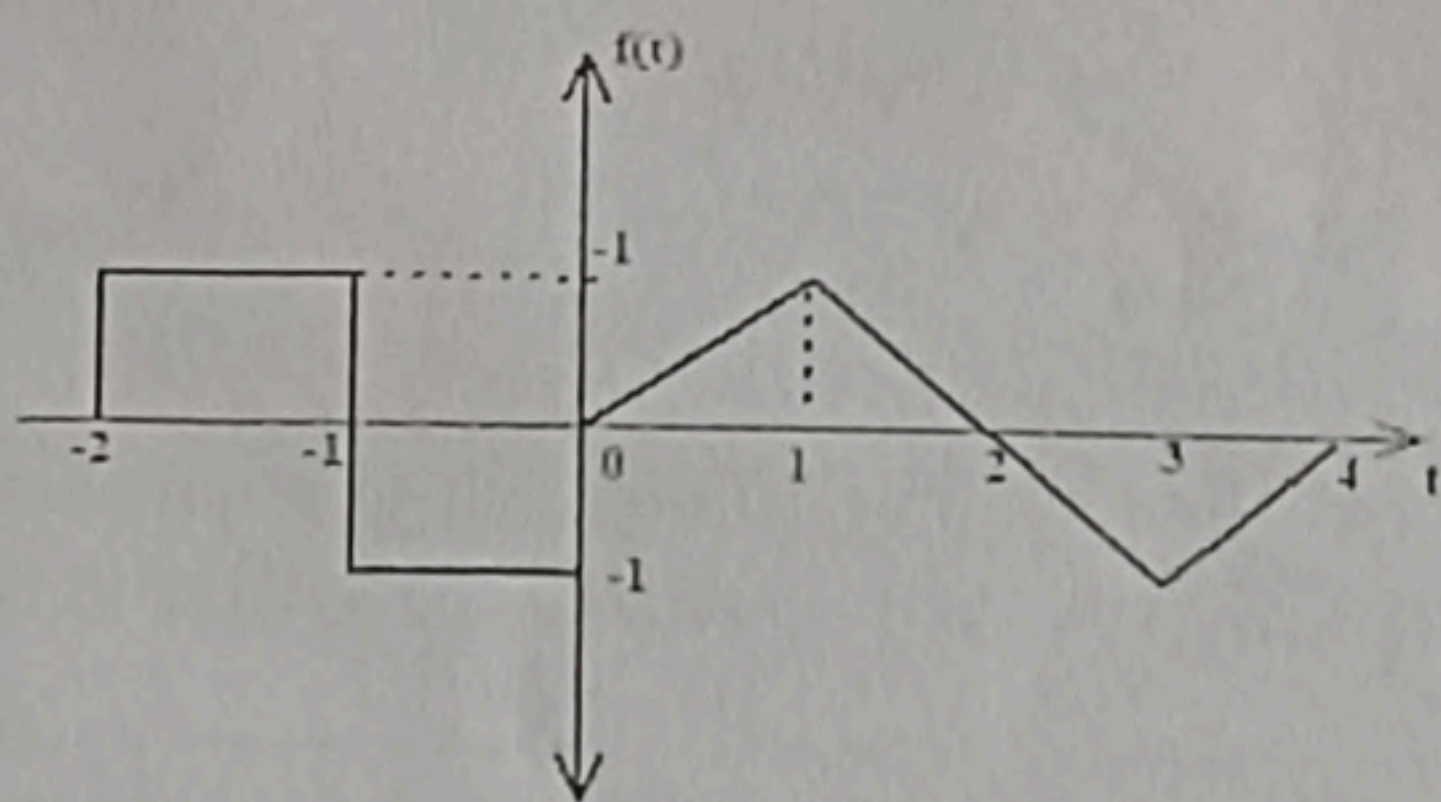
## Continuous Assessment Test (CAT) – I AUGUST 2025

|                            |   |                     |              |   |                 |
|----------------------------|---|---------------------|--------------|---|-----------------|
| Programme                  | : | <b>B.Tech (BVD)</b> | Semester     | : | FS 2025-26      |
| Course Code & Course Title | : | BEVD203L            | Class Number | : | CH2025260100508 |
| Faculty                    | : | Dr. Saurav Gupta    | Slot         | : | G1+TG1          |
| 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.    | a.       | Find the energy and power of the given signal and then determine whether the signal is an energy signal or a power signal.<br>$x[n] = \left(\frac{1}{2}\right)^n u[n]$                                                                                | 5     | 1  | K2       |
|       | b.       | Represent the signal $f(t)$ as shown in Figure 1 in terms of step and ramp signals<br>                                                                            | 5     | 1  | K2       |
| 2.    | a.       | Determine whether the following discrete-time signals are periodic or not. If periodic, determine the fundamental period.<br>i. $x(n) = e^{j2n/3} - e^{j4\pi n/7}$<br>ii. $x(n) = \sin\left(\frac{n}{2}\right) \cdot \sin\left(\frac{n\pi}{2}\right)$ | 6     | 1  | K2       |
|       | b.       | Consider a signal as shown in Figure 2. Draw the signal for the following operations.                                                                                                                                                                 | 9     | 1  | K2       |



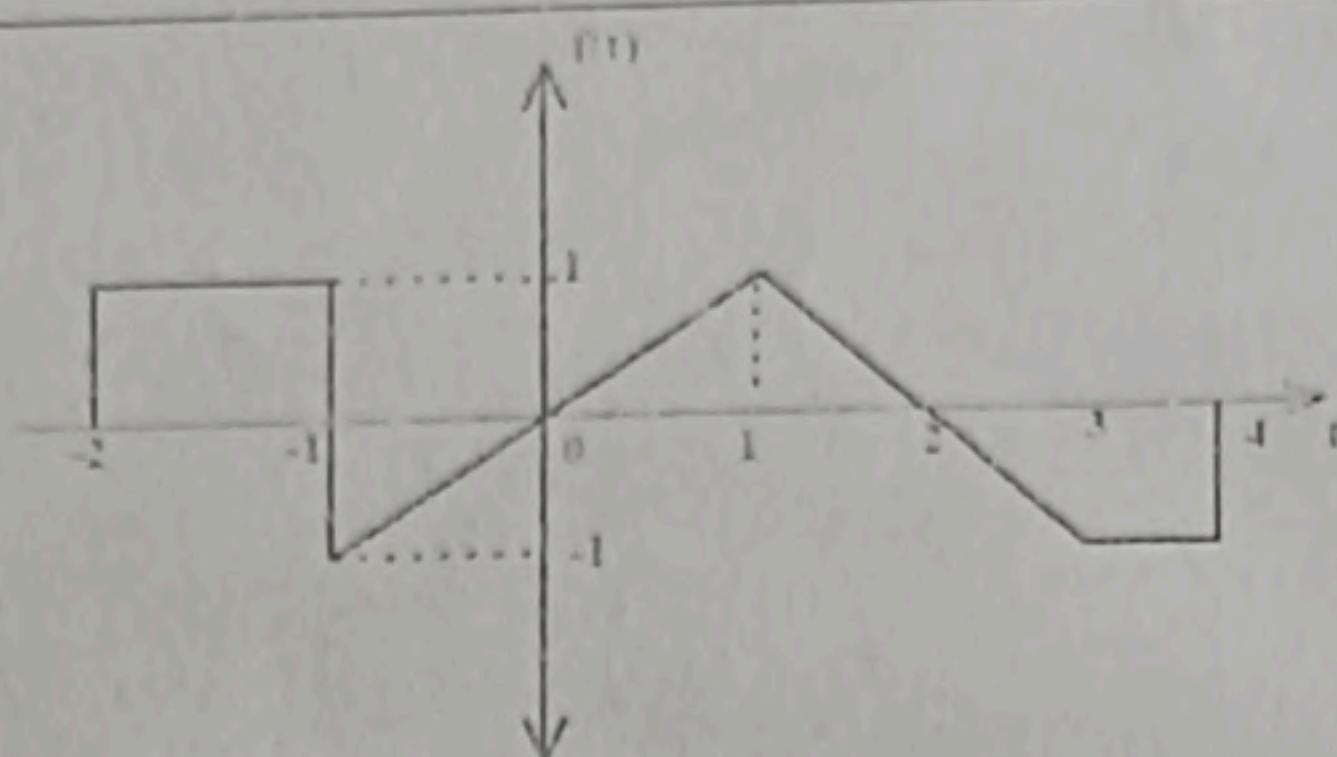


Figure 2

- i.  $f(-2t + 2)$
- ii.  $f\left(\frac{t-2}{2}\right)$
- iii.  $f(-t + 2) \cdot u(-t)$

3.

Comment whether the given system is (i) Causal, (ii) Linear, (iii) Time Invariant, (iv) Static, and (v) Stable.

- i)  $y(t) = \cos(3t) \cdot x(t) + x(t) \cdot u(t+1)$
- ii)  $y[n] = nx[n] + 3$

10

2

K2

Find the response of the system shown in Figure 3:

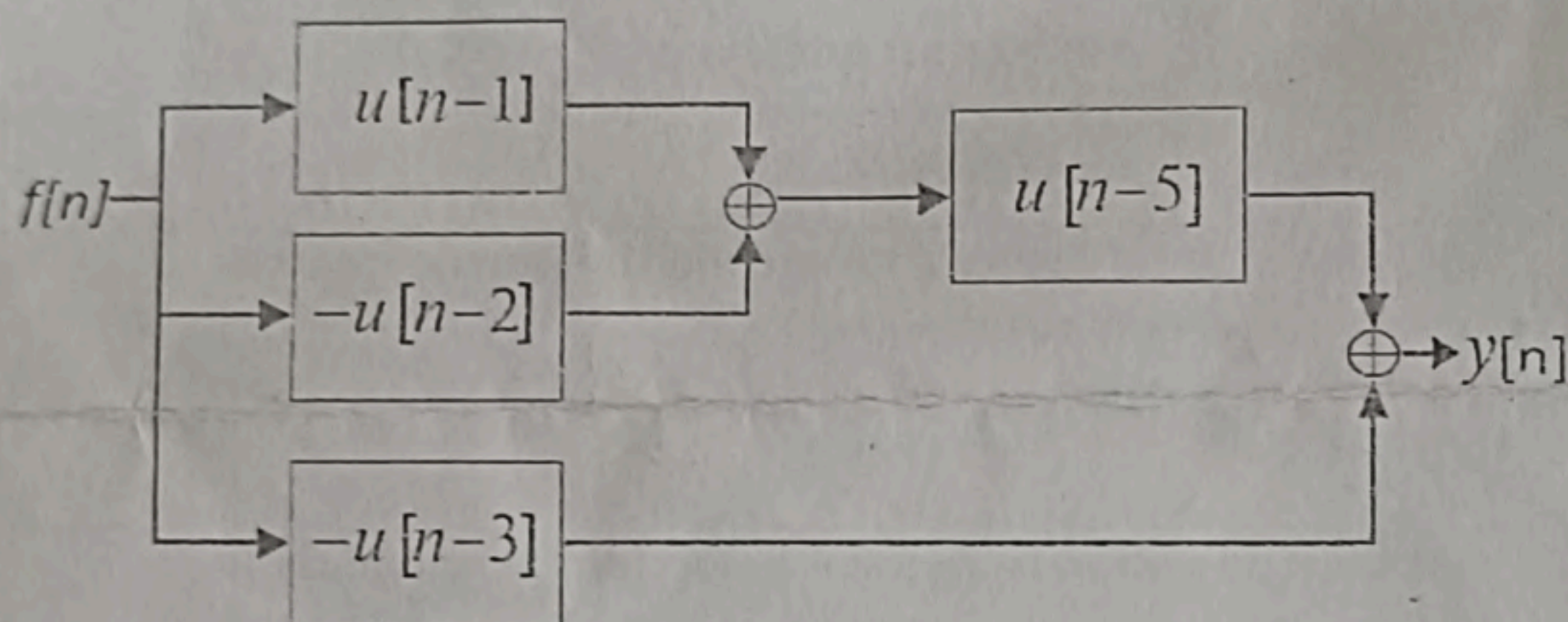


Figure 3

When,  $f(n) = \{-2, -2, 1, 2, 3\}$

4.

5

2

K3

b.

The response of a continuous time LTI system to a unit-step input is given as  $[2u(t) + u(t-1)]$ . Find the response of the system to an input  $e^{2t}u(t)$ .

5

2

K3

5.

Find the correlation between the signals  $f[n]$  and  $g[n]$  as given as follows:

$f[n] = \{1, -2, 2, 4, 3\}$

$g[n] = \{2, 1, -3, 2\}$

where arrow represents the samples at zeroth location.

5

2

K3

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