FALL SEMESTER 2025-2026

Programme Name & Branch	**: B. Tech -ECE and BML**
Course Code and Course Name	**: BECE202L Signals and Systems**
Faculty Name(s)	**: Dr. M KARTHIKEYAN, Dr. RAJESH N, Dr. NAWAZ SHAFI, Dr. JAGANA BIHARI PADHY, Dr. SARANYA K.C.**
Class Number(s)	**: VL2025260100449,3482,3484, 3485,3493**
Date of Examination	**: 06-10-2025**
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

  3. Perform the transformation of CT and DT signals from time domain to frequency domain and understand the concept of distribution of energy as function of frequency.

  4. Convert the CT signals to DT signals and vice-versa and understand their consequences.

Q. No	Question	M	CO	BL
1.	Express the sequence $x[n] = 1.2 + \cos\left(\frac{\pi n}{6n} + \frac{\pi}{4}\right) + 0.6 \sin\left(\frac{\pi n}{3} - \frac{\pi}{2}\right)$ in DTFS form and sketch the corresponding amplitude and phase spectra.	10	3	2
2.	Let $x[n] = \sum_{k=-\infty}^{+\infty} \delta[n-5k]$. Compute the Fourier series coefficients of $x[n]$ using exponential Fourier series and also compute $\frac{1}{N}\sum_{n=<N>}\lvert x[n]\rvert^2$ using the properties of exponential Fourier series.	10	3	2
3.	Find the DTFT of the signal $x[n] = n\left(\frac{1}{2}\right)^{\lvert n\rvert}$	10	4	3
4.	Let the signal y(t) be defined as: $y(t) = x(t-3)e^{j6\pi t} + x(t).cos2\omega_0 t$ Where: $x(t) = e^{-2t}u(t)$. Find the Fourier Transform Y(jω) of y(t) without directly evaluating any integrals. Clearly state each property used.	10	4	2
5.	Consider a continuous-time LTI system described by $\frac{dy(t)}{dt} + 3y(t) = 2x(t)$. (a) Determine the transfer function or frequency response $H(w)$ of the above system. (b) Find the output y(t) of this system if the input $x(t) = e^{-2t}u(t)$ is applied.	10	4	3

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