Reg. Number	24BVD1017

VIT
Vellore Institute of Technology
CHENNAI

Continuous Assessment Test (CAT) – II October 2025

Programme	:	B.Tech (BVD)	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.		Using Z- Transform, solve the difference equation to find the response $y[n]$ of the LTI system with input $x[n] = \delta[n]$. $y[n+2] - 1.5y[n+1] + 0.5y[n] = x[n]$	10	CO3	BT3
2.		Compute the **8-point DFT** of the following sequence using Radix-2 Decimation-in-Time (DIT) FFT algorithm $x[n] = \{-1, 3, 2, -2, -3, 4, 2, 1\}$, for n=0 to 7	10	CO3	BT3
3.		(i) Find the Fourier transform of the following signal $f(t) = te^{-a\|t\|}$ (ii) Given the Fourier transform $F(\omega) = 4\,Sinc(\omega/2)$ Find the inverse Fourier Transform.	5+5	CO3	BT3
4.		Consider a finite impulse response (FIR) filter of length 7 with impulse response: $h[n] = \{2, 3, 5, 6, 5, 3, 2\}$ for $n = 0$ to 6 (i) Derive the **frequency response** $H(e^{j\omega})$ and express it in the standard form: $H(e^{j\omega}) = e^{-j\omega(N-1)/2}.A(\omega)$ (ii) Comment on the computational complexity reduction in evaluating $H(e^{j\omega})$ due to Symmetry.	7+3	CO4	BT3
5.		(i) Design a linear-phase FIR low-pass filter with cutoff f_c=1 kHz, sampling frequency f_s=8 kHz, and filter length M=9, using a Blackman window. (ii) Identify the type of linear-phase FIR filter (Type-I, Type-II, Type-III, or Type-IV).	8+2	CO4	BT3

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