



Course : B.Tech (ECE)  
Class Nbrs : VL2023240501354, 1338, 1343, 1345, 1348, 1352, 3749,  
Slot : C2+TC2  
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Each Question carries 10 marks

Q.No	Question	Marks
1.	Determine the following; a. The DT system $y[n] = \text{sgn} x[n] $ is static or dynamic b. The DT system $y[n] = \sum_{k=-\infty}^{n+4} x[k]$ is causal or not c. The system $h[n] = 2^n u[-n]$ is stable or not d. The signal $x[n] = e^{\frac{j2\pi}{3}n} + e^{\frac{j3\pi}{4}n}$ is periodic or not. If periodic find the fundamental period e. The signal $x[n] = 2e^{j(\pi n + \theta)}$ is energy or power signal. Justify your answer	10
2.	(a) A causal LTI system is given by the difference equation: $y[n] + 2y[n-1] + y[n-2] = x[n]$ (i). Determine the transfer function $H(z)$ of the system. (ii). Draw the pole-zero diagram of $H(z)$ . Is the system stable? Justify. (b). Find DTFT of the following signal: $x[n] = (n+1) \left(\frac{1}{4}\right)^n u(n)$	2+3+5
3.	Find circular convolution of the following sequences $x(n) = \{1, 1, 1, 2\}$ ; $y(n) = \{1, 2, 3, 2\}$ using DFT and IDFT method.	10
4.	Using the properties of DFT find the following If, $DFT\{x(n)\} = X(k) = \{4, -2j, 0, 2j\}$ , i. DFT of $x(n-2)$ ii. DFT of $x(-n)$ iii. DFT of $x^2(n)$ iv. Signal Energy	10
5.	Compute the eight-point DFT of the sequence $x(n) = [0.5, 0.5, 0.5, 0.5, 0, 0, 0, 0]$ . Using DIF-FFT algorithm. Indicate the intermediate node values.	10