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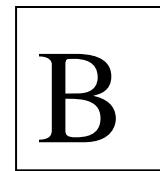


SNS College of Technology, Coimbatore-35.

(Autonomous)

B.E/B.Tech Internal Assessment -I

Academic Year 2023-2024(Even)



Fourth Semester

Electronics and Communication Engineering

19ECB212 – Digital Signal Processing

Time: 1^{1/2} Hours

Maximum Marks: 50

Answer All Questions

PART - A (5 x 2 = 10 Marks)

		CO	Blooms
1.	If $x(n) = \{4,1\}$. Find $X(K)$ of the given sequence.	CO1	Rem
2.	Outline the mathematical and graphical representation of unit step signal.	CO1	Und
3.	Sketch the 2 Point DIF FFT.	CO1	Rem
4.	Compare analog and digital filter.	CO2	Und
5.	Define Impulse Invariant transformation.	CO2	Rem

PART – B (2 x 13 = 26 Marks) (1 x 14 = 14 Marks)

		CO	Blooms
6. (a)	State and prove any five properties of DFT.	13	CO1 Und
	(or)		
(b)	(i) Find the linear convolution $x(n) = \{1,2,3,4,4,3,2,1\}$ and $h(n) = \{-1,1\}$ using Overlap Add Method (ii) Find the DFT of the given sequence $x(n) = \{1,2,3,4\}$ using radix-2 DIF - FFT algorithm	7 6	CO1 Rem
7. (a)	Analyze Butterworth digital IIR high pass filter satisfying the following constraints using Bilinear transformation. $T = 0.1$ Sec $0.6 \leq H(e^{j\omega}) \leq 1.0$; for $0.7\pi \leq \omega \leq \pi$ $ H(e^{j\omega}) \leq 0.1$; for $\pi \leq \omega \leq 0.35\pi$	13	CO2 Ana

		(or)			
	(b)	(i) Find $H(z)$ using impulse invariant technique for the analog filter design. $H(z)=10/(S^2 + 7S+10)$ (T = 0.2sec) (ii) Find $H(z)$ using bilinear transformation when $H(s) = 1/ (S+1)^2$, T=0.1 Sec	7 6	CO2	Rem
8.	(a)	Examine radix-2 DIT - FFT algorithm for the sequence $x(n) =\{2,2,2,2,1,1,1,1\}$.	14	CO1	Ana
		(or)			
	(b)	(i) Apply circular convolution steps of the given sequences $X_1(n) = \{1,2,3,4\}$ and $X_2(n) = \{1,-1,2,1\}$ (ii) Make use of Discrete Fourier Transform to find $X(K)$ for the given sequence: $x(n) =\{1,0,1,0\}$	7 7	CO1	App

Abbreviations:

CO – Course Outcomes; **Rem**- Remembering; **Und** – Understanding; **App** – Applying;
Ana – Analyzing; **Eva** – Evaluating; **Cre**- Creating