

Code No: D4905**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012****DIGITAL SIGNAL PROCESSING
(ELECTRICAL POWER ENGINEERING)****Time: 3hours****Max. Marks: 60****Answer any five questions
All questions carry equal marks**

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- 1.a) Define the following terms as referred to LTI discrete time system
 - i) Stability
 - ii) Causality
 - iii) Time Invariance
 - iv) Linearity
- b) A causal LTI system is defined by the difference equation
 $2y(n)-y(n-2)=x(n-1)+3x(n-2)+2x(n-3)$.
Find the frequency response, magnitude response and phase response.
- 2.a) State and prove time and frequency shifting properties of Fourier transform.
- b) Compute the DFT of the three point sequence $x(n)=\{2,1,2\}$. Using the same sequence, compute the 6 point DFT and compare the two DFTs.
- 3.a) Compute the DFT of the sequence given below using Radix-2, DIT-FFT algorithm $X(n)=\{1,1,1,1,0,0,0,0\}$
- b) Explain the inverse DFT using DIF-FFT radix-2 algorithm.
- 4.a) Determine the impulse response of the system described by the difference equation, $y(n)-3y(n-1)-4y(n-2)=x(n)+2x(n-1)$ using z-transform.
- b) Realize the given system in parallel form of 2nd order systems.
 $H(z)= (1+1/2z^{-1}) / [1- z^{-1}+1/4z^{-2}] [1- z^{-1}+1/2z^{-2}]$
- 5.a) Compare the Butterworth and Chebyshev approximations.
- b) Discuss impulse invariance method and bring out its merits and demerits.
- 6.a) Use a hamming window to find fourth order linear phase FIR filter to approximate ideal low pass filter $e^{-j2\omega}$ for $|\omega| \leq 1$ and zero for $\pi \leq |\omega| \leq 2\pi$.
- b) Compare FIR and IIR filters.
- 7.a) What are the advantages of DSP processors compared to other conventional Processors?
- b) Explain the architecture of TMS 320C5X Processor with suitable block diagram.
8. Write short notes on any two of the following
 - a) Multiplier Accumulator (MAC)
 - b) Spectrum Analyzer of Sinusoidal
 - c) On-Chip peripherals
