JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-2008

III B.TECH SUPPLIMENTARY EXAMINATIONS
DIGITAL SIGNAL PROCESSING
(ELECTRICAL AND ELECTRONICS ENGINEERING)

AUG/SEP-2008

MARK-3 HOUR
MARK-80

ANSWER ANY FIVE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

1. (a) Define the following terms as referred to LTI discrete time system:

i. Stability
ii. Causality
iii. Time invariance
iv. Linearity.

(b) Determine whether the following system is

i. Linear
ii. Causal
iii. Stable

iv. Time invariant
$y(n) = \log_{10} |x(n)|$ Justify your answer.

2. (a) What is " padding with Zeros ", explain with an example, Explain the effect of padding a sequence of length N with L Zeros (or frequency resolution).

(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) Let x(n) be a real valued sequence with N-points and Let X(K) represent its DFT , with real and imaginary parts denoted by XR(K) and XI(K) respectively. So that $X(K) = XR(K) + JXI(K)$. Now show that if x(n) is real, XR(K) is even and XI(K) is odd.

(b) Compute the FFT of the sequence $x(n) = \{ 1, 0, 0, 0, 0, 0, 0, 0 \}$

4. (a) Explain how the analysis of discrete time invariant system can be obtained using convolution properties of Z transform.

(b) 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.

5. (a) What is frequency warping ? How it will arise.

(b) Compare Impulse invariant and bilinear transformation methods.

6. Find frequency response of Hamming window and also find different parameters from it.

7. (a) Discuss the applications of Multirate Digital Signal Processing.

(b) Describe the decimation process with a factor of ' M '. Obtain necessary expression.

8. Discuss various interrupt types supported by TMS320C5X processor.