B.E. Degree Examinations, Nov/Dec 2011(R-2004)

Electrical and Electronics Engineering

Sixth Semester

EE383 Digital Signal Processing

Time: 3 Hours | Max. Marks: 100

Answer ALL Questions

PART – A (10 x 2 = 20 Marks)

1) What are energy & power signals? Give an example for each.

2) Represent graphically the sequence x(n) = [-1, 2, 1, -2, 1] as a shifted sequence advanced by 2 samples .

3) Compute the linear convolution of (n) = x(n) x h(n)

   i. where x(n) = { 2, 2, 2, 2} and

      1. h(n) { -1, -1, -1, -1 }.

4) Find the system transfer function H(Z) if Y(n)=x(n)+2x(n-1).

5) What is need for Zero Padding?

6) Give the Basic structure of the Butterfly diagram for DIT Algorithm.

7) How are digital filters catogorised?

8) What is Gibbs Oscillations?

9) What is quantization error?

10) What is difference of Harvard Architecture and Von Neumann Architecture?

PART – B (5 X 16 = 80 Marks)

11. Explain the role of windowing to realize a FIR filter. Explain on the choice and type of windows selection for signal analysis. Compare numerically the effect of Hamming and Hanning windows (5+5+6)

And design the filter if

Cut-off frequency = 200Hz.

Sampling frequency = 1200Hz.

Order of filter = 3

Filter length required= 6

Plot the effect of both Hanning and Hamming windows. (8+8)

12.(a) What is the need for frequency response analysis? Determine the frequency response and plot the magnitude response and phase response for the system. (8+8)

$$y(n) = x(n) + x(n-1) - 0.5\, y(n-2)$$

(OR)

12 (b) A difference equation describing a filter is given by $y(n) - 3\, y(n-1) + y(n+1) = x(n) + \frac{1}{2}\, x(n-2)$. Obtain direct form I, form II structures. (8+8)

13.(a) For a sequence $x(n) = \{4, 4, 2, 2, 2, 2, 1, 1\}$ obtain the 8pt FFT computation using DIT method. (16)

(OR)

13.(b) Obtain the system function of the digital filter if the analog filter is

$$H_a(s) = 1/[(s+0.2)^2 + 16]$$

Using the Impulse invariance method, Bilinear Transformation method obtain the digital filter. (8+8)