ANNA UNIVERSITY OF TECHNOLOGY, COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : NOV / DEC 2011

REGULATIONS : 2007 & 2008

FIFTH SEMESTER

070290037 - 080290029 - DIGITAL SIGNAL PROCESSING

(COMMON TO ECE / MEDICAL ELECTRONICS)

Time : 3 Hours   Max.Marks : 100

PART - A

(10 x 2 = 20 MARKS)

ANSWER ALL QUESTIONS

1. State any two properties of DFT.

2. Find the values of W_N^k , when N=8, for k=2, 3.

3. When an FIR filter is said to be a linear phase FIR filter?

4. Write the expression for Kaiser Window.

5. Why impulse invariant transformation is not a one-to-one mapping?

6. Define prewarping.

7. Discuss the truncation error in quantization process.

8. Why Scaling is important in Finite word length effect.

9. What are the different buses of TMS 320C50 processor and list their functions.

10. What are the shift instructions in TMS 320 C50 processor?

PART - B

(5 x 16 = 80 MARKS)

ANSWER ALL QUESTIONS

11. (a) Compute the 8 point DFT of the sequence x (n) = [1, 2, 3, 4, 4, 3, 2, 1] using the in place radix 2 DIT FFT algorithm.

(OR)

11. (b) Find the output y(n) of a filter whose impulse response is h(n) = {1,1,1} and input signal x(n) = {3,-1,0,1,3,2,0,1,2,1} using overlap save method.

12. (a) The desired response of a low pass filtering

$$H_d(e^{jw})=e^{-j3w} \quad -3\pi/4 \leq \omega \leq 3\pi/4$$

$$=0 \quad 3\pi/4 \leq |\omega| \leq \pi$$

Design the filter for M=7 using Hanning window.

(OR)

12. (b) Explain in detail about frequency sampling method of designing FIR filters.

13. (a) Briefly explain about Bilinear transformation of digital filter design.

(OR)

13. (b) Obtain the Direct form-I, cascade and parallel form realization for the following system

$$y (n) = -0.2 y(n-1) + 0.5 y(n-2) + 6 x(n) + 4.5 x(n-1) + 0.8 x(n-2)$$

14. (a) Derive the quantization input noise power and determine the signal to noise ratio of the system.

(OR)

14. (b) Write short notes on :
    (i) Limit cycle oscillations with an example.
    (ii) Dead band effect.

15. (a) Draw and explain the architecture of TMS 320C50 processor

(OR)

15. (b) Explain in detail about MAC unit and Pipelining with reference to TMS320C50 processor.

*****THE END*****