B.E. (FULL-TIME) DEGREE END SEM EXAMINATIONS April/May2012
ELECTRICAL AND ELECTRONICS ENGINEERING
VII SEMESTER (REGULATION 2004)
EE 471: DIGITAL SIGNAL PROCESSORS

Time: 3 Hours   Max. Marks: 100

Answer ALL Questions

PART – A (10 x 2 = 20 Marks)

1   What are the components of DSP system?

2   What are the advantages of using programmable DSP processors? How are DSP processors compared with application-specific integrated circuits (ASICs), general-purpose micro processors, and micro controllers.

3   Perform Binary Multiplication :   2.4 * -12.16

4   Explain bit reversal addressing mode.

5   What are the various interrupt types supported in 5X processor

6   Give a brief account of the load/store instructions of 5X processor

7   List the data buses and address buses in 'C3X processor?

8   List the number of execution of pipeline stages used in C3x and C67x processors

9   Show the generic block diagram of Adaptive filter

10   Briefly Investigate the effects of quantizing adaptive filters

PART – B (5 x 16 = 80 Marks)

11   a   (i)   Show the memory map of TMS320c5510   (4)
         (ii)   What is the Software and Hardware development tools required to   (12)
                design a new DSP based application. Explain the each component.

12   a   (i)   Discuss and draw the Signal flow diagram of FIR and IIR filter. Obtain   (16)
                its transfer function in z domain.
                                        OR
      b   (i)   Write the differences between fixed point and floating point Digital   (8)
                signal processor
         (ii)   Show the interfacing diagram between DSP Processor and host   (8)
                device

13   a   (i)   Draw the internal architecture diagram of 5X and indicate the various   (8)
                blocks.
         (ii)   What are instructions of C5X which are used for block transfer   (8)
                                        OR
      b   (i)   Write a C5X program to generate a Triangular wave   (8)
         (ii)   Explain how the FSK signal may be demodulated using a C5X   (8)
                program

14 a (i) List the various data formats available in 'C3X processor (8)

    (ii) Show the Fixed point implementation of IIR Filter (8)

OR

  b (i) Describe the two basic techniques which can be used for (16)
generating random numbers

15 a (i) List and describe the various adaptive algorithm (16)

OR

  b (i) Discuss the effects of choosing filter L for an adaptive FIR (8)
filter with the LMS algorithm in terms of stability, convergence
rate and excess MSE of the algorithm.

    (ii) As shown in the figure below, if the unknown system is given (8)
as $P(z)=0.75+0.5z^{-1}-0.6\ z^{-2}$, the adaptive filter is
$W(z)=w_0+w_1\ z^{-1}+w_2\ z^{-2}$, and excitation signal x(n) is a zero
mean white noise with variance 1, find the following:
- The R matrix and p vector
- The optimum solution of adaptive filter w
- The minimum MSE after the convergence of the
adaptive filter
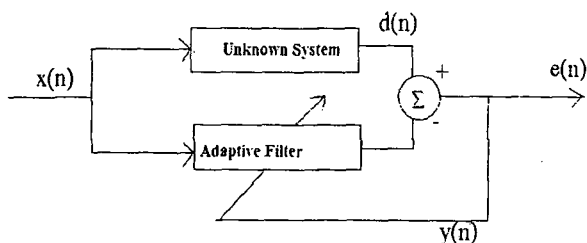
System Identification using adaptive filters