NR

Code No: B7703, B5502, B5708

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II SEMESTER EXAMINATIONS, APRIL/MAY 2012
DSP PROCESSORS AND ARCHITECTURES
(COMMON TO EMBEDDED SYSTEMS & VLSI DESIGN, EMBEDDED SYSTEMS, VLSI SYSTEMS DESIGN)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks

\- - -

1.a) An LTI system is described by the difference equation y(n)=ay(n-1)+bx(n). Find the impulse response, magnitude function and phase function. Find the value of b if $|H(jw)| = 1$. Sketch the magnitude and phase response for a=0.9.

b) Explain the need for decimation and interpolation.

2.a) Find the 8-point DFT of the sequence x(n)= $\{ 1 , 1 , 1 , 1 , 1 , 1 , 0 , 0 \}$.

b) The output of a 12 bit A/D converter is passed through a digital filter which is described by its difference equation y(n)=x(n)+ 0.2y(n-1). Calculate the steady state output noise power due to A/D converter quantization.

3.a) Distinguish between the following Interrupts
i) Maskable and Non Maskable Interrupts
ii) Software and Hardware Interrupt.

b) Explain the pipeline implementation of 16 tap FIR filter using 16 MAC.

4.a) Draw the functional architecture of TMS320C54X processor and explain about each block.

b) Explain about Zero overhead looping feature of DSP Processor.

5.a) Write an assembly language program for the FIR filter implementation with delay elements.

b) Explain how bit reversed addressing mode is useful for DFT computation and write the code for 8-point DFT using bit reversed addressing mode.

6.a) Explain how an audio signal is processed using the CODEC Interface circuit.

b) What is the purpose of Multichannel Buffered Serial Port (MCBSP) and explain with the help of an example.

7.a) Explain the memory organization in TMS320C54X Processor with neat diagram.

b) Explain about the programmable I/O mode of DSP processor.

8. Write short notes on any TWO of the following
a) Logical Instruction set of TMS320C54X processor with example
b) Implementation of PID Controllers
c) Adaptive Filters.

****