R09

Code No: C3703

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I - Semester Examinations, March/April -2011
DSP PROCESSOR ARCHITECTURE AND APPLICATIONS
(CONTROL ENGINEERING)

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

Answer any five questions
All questions carry equal marks
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1) a) Write a MATLAB Program for FIR filter implementation using different Windowing techniques. Use switch function for the appropriate selection of the technique.
   b) Derive an expression for interpolation by a factor I, a process of sampling rate conversion both in time and frequency domain. [6+6]

2) a) Prove that the dynamic range of a signal increases by 6dB for each additional bit used to represent its value.
   b) Compute the dynamic range and the percentage resolution for a block floating point with a 4-bit exponent used in a 16-bit fixed point processor. [6+6]

3) a) Explain the function of a MAC unit and also explain how overflow and underflow conditions can be avoided in MAC operations.
   b) Explain how bit reversed addressing is achieved in TMS320C54XX Processor [6+6]

present? What are their names? Explain about the complete bus architecture with data widths.
   b) Explain how DSP Processors support the external Interface with all the features. [6+6]

5) a) Write an assembly Language program to multiply two Q15 numbers.
   b) What values are represented by the 16-bit fixed point number N = 4000h in Q15 and Q7 notation. [6+6]

6) a) Implement an 8-Point FFT on TMS320C54XX Processor.
   b) Explain the Implementation of a FIR Filter with the help of different steps and flowchart diagram on TMS320C54XX Processor. [6+6]

7) a) Explain how DMA concept is useful in DSP Processors.
   b) Explain the mode control interface signal timing for the PCM3002 CODEC [6+6]

8) a) Explain about Multichannel Buffered Serial Port in DSPs.
   b) Explain how the signal Spectrum is computed. [6+6]

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