

**R09**

**Code No: 09A70405**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech IV Year I Semester Examinations, May/June - 2013**

**DSP Processors and Architectures**

**(Electronics and Communication Engineering)**

**Time: 3 Hours**

**Max. Marks: 75**

**Answer any Five Questions  
All Questions Carry Equal Marks**

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- 1.a) Find the Fourier Transform for  $x(t) = 15000\text{sinc}^2(15000t)$  and also find the total energy in  $x(t)$ ?
- b) Explain how the Filter design analysis tool of matlab is useful in designing a filter. [7+8]
- 2.a) Explain the effects of quantization noise in digital signal processing.
- b) Explain about different types of number formats for signals and coefficients in digital signal processing systems. [7+8]
- 3.a) Explain the basic architectural features of digital signal processors.
- b) Explain barrel shifter and compare, select and store unit (CSSU) s with functional diagrams. [7+8]
- 4.a) Explain how hardware looping increases the speed of execution in a DSP Processor.
- b) Explain the concept of pipelining in different DSP processor families with examples. [7+8]
- 5.a) Explain about circular addressing mode along with the steps involved to set up circular buffers.
- b) Explain how to write a command file with memory address allocation to memory pages, different sections of internal data and external data. [7+8]
- 6.a) Determine the value of the following 16-bit numbers represented using the given Q notations  
i) 4400h as Q0 number ii) 4400h as Q7 number iii) 0.3125 as Q15 number  
iv) -0.3125 as Q15 number
- b) Explain how a PID controller can be implemented using TMS320C54XX processor along with the pseudo code. [7+8]
- 7.a) Explain how the bit-reversed index generation can be done in 8 point FFT. Also write a TMS 320 C 54 xx program for 8 point DIT FFT bit reversed index generation
- b) Explain, how scaling prevents overflow conditions in the butterfly computation. [7+8]
- 8.a) Explain the ADC interface in programmed I/O mode
- b) Explain about different Multichannel buffered serial port registers and programming. [7+8]

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