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Reg. No. : .....

Name : .....

First Semester M.Tech. Degree Examination, March 2014
(2013 Scheme)
Electronics and Communication
Stream : Signal Processing
TSC 1002 : DSP SYSTEM DESIGN

Time : 3 Hours Max. Marks : 60

***Instruction** : Answer **any two** questions from **each** Module.*

MODULE – I

1. Describe the basic features that should be provided in DSP architecture to be used to implement N^{th} order FIR filter $y(n) = \sum_i x(i)\, h\,(n-i)$

   $x(n) \rightarrow$ I/P sample, $y(n) \rightarrow$ O/P sample
   $h(i) \rightarrow i^{th}$ filter coefficient.

2. Using CORDIC algorithm, compute sin (45) and cos (45) to a precision of six bits.

3. a) Find the largest number that can be represented with a 9 bit LNs format (radix 2)

   b) With the aid of a suitable architecture, explain Baugh-Wooley multiplier.

MODULE – II

4. Which has a lower miss rate a 16 KB instruction cache with a 16 KB data cache or a 32 KB unified cache ? Assume 36% of the instructions are data transfer instructions. Assume a hit takes 1 clock cycle and miss penalty is 100 C/K cycles. A load/store hit takes 1 extra clock cycle on a unified cache if there is only one cache port to satisfy two simultaneous requests. What is the average memory access time in each case ? Assume write-through caches with a write buffer and ignore stalls due to write buffer. Misses/1000 Insn
   (Size – 16 KB, instruction cache – 3.82, Data cache – 40.9, unified cache – 51.0)
   (Size – 32 KB, instruction cache – 1.36, Data cache – 38.4, unified cache – 43.3)

P.T.O.

5. With the help of a suitable architecture, explain Tomasulo's algorithm for dynamic scheduling.
6. A two way set associative cache memory uses blocks of 4 words. The cache can accommodate a total of 2048 words from main memory. The main memory size is 128K×32. Formulate all pertinent information required to construct the cache memory. What is the size of cache memory ?

MODULE – III

7. Explain with an example, the difference between linear and circular addressing modes in C6713 processor.
8. a) Explain the function of following registers :
   1) Period count register
   2) Timer count register
   3) Timer control register.

   b) Briefly explain the application of EDMA controller in C6713 processor.
9. a) Explain how GPIO pins of TMs 320 C 6X processor can be configured as I/P or O/P pin.

   b) Give the salient features of TMs 320 C 6X processor.