Fourth Semester B.E. Degree Examination, December 2011
Computer Organization

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. With a neat diagram, explain the different processor registers. **(08 Marks)**
   b. Derive the basic performance equation. Discuss the measures to improve the performance. **(08 Marks)**
   c. Convert the following pairs of decimal numbers to 5 bit signed 2's complement no and add them. State whether or not overflow occurs. i) 8 and 14 ii) – 10 and –5. **(04 Marks)**

2 a. Explain BIG – ENDIAN and LITTKE – ENDIAN methods of byte addressing, with proper examples. **(06 Marks)**
   b. What is an addressing mode? Explain the different addressing modes, with an example for each. **(10 Marks)**
   c. Explain the memory mapped I/O and program controlled I/O. **(04 Marks)**

3 a. Explain with a specific example, how a stack frame is built and dismantled for a particular invocation of a subroutine. **(08 Marks)**
   b. Draw and explain the general 8 bit parallel interface. **(08 Marks)**
   c. Define exceptions. Explain two kinds of exceptions. **(04 Marks)**

4 a. What is the necessity of a DMA controller? Showing the possible register configurations in DMA interface, explain the direct memory access. **(08 Marks)**
   b. Explain the following , with respect to USB :
      i) USB architecture ii) USB addressing iii) USB protocols. **(09 Marks)**
   c. Explain the centralized and distributed BUS arbitrations, briefly. **(03 Marks)**

PART – B

5 a. With a neat block diagram, explain the organizations of 1KX1 memory chip. **(06 Marks)**
   b. Define : i) Memory latency ii) Memory bandwidth
               iii) Hit – rate iv) Miss – penalty. **(04 Marks)**
   c. Explain the different mapping functions, used in cache memory. **(10 Marks)**

6 a. Write a note on flash memory. **(04 Marks)**
   b. With a block diagram, explain the virtual memory organization. **(06 Marks)**
   c. In a carry look ahead addition, explain the generate G_i and propagate P_i functions for stagei. Using this design 4 bit carry look ahead adder. **(10 Marks)**

7 a. Perform the signed multiplication of numbers +13 and – 6 using the booth multiplication algorithm. Represent the numbers in 5 bits including sign bit. Give the booth multipliers recoding table that is used in the above multiplication. **(08 Marks)**
   b. Perform division of number 8 by 3 (8 ÷ 3) using the restoring division algorithm. **(08 Marks)**
   c. Explain the different arithmetic operations on floating point numbers. **(04 Marks)**

8 a. Write and explain the control sequences for the execution of following instruction :
      Add (R3), R1. **(06 Marks)**
   b. With a neat diagram, explain a three bus organization. Write control sequence for the instruction Add R1, R2. R3. **(08 Marks)**
   c. With a block diagram, explain a compete processor. **(06 Marks)**

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