Second Semester M.Tech. Degree Examination, June/July 2013

Advances in Computer Architecture

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Discuss how desktop and embedded systems have brought in changes in computing.
      (10 Marks)
   b. Suppose that we want to enhance the processor used for web serving. The new processor is 10 times faster in computation in web serving application than the original processor. Assuming that the original processor is busy with computation 40% of the time and is waiting for I/O 60% of time, what is the overall speedup gained by incorporating the enhancement? **(05 Marks)**
   c. Explain the quantitative principles of computer design. **(05 Marks)**

2 a. Explain structural hazard with block diagram. **(10 Marks)**
   b. Discuss the core issues on limitations of ILP. **(10 Marks)**

3 a. List and explain advanced optimizations of cache performance. **(12 Marks)**
   b. Explain 3C's with suitable example. **(08 Marks)**

4 a. Discuss how processes are protected from each other through virtual memory. **(10 Marks)**
   b. Discuss the cross cutting issues in the design of memory hierarchies. **(10 Marks)**

5 a. How software pipelining help to uncover parallelism? **(10 Marks)**
   b. How hardware supports for exposing parallelism through predicated instructions? **(10 Marks)**

6 a. Discuss the performance of a scientific workload on a distributed memory processor.
      (10 Marks)
   b. How to implement a cache coherence in a DSM multiprocessor? **(10 Marks)**

7 a. Explain the basic techniques of integer arithmetic. **(10 Marks)**
   b. With an example, explain floating point multiplication. **(10 Marks)**

8   Write short notes on:
   a. Fallacies and pit falls in computer design
   b. Pentium – 4
   c. The intel-IA64 architecture
   d. Speeding up integer addition. **(20 Marks)**

* * * * *