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10SCS23

Second Semester M.Tech. Degree Examination, June 2012
Advances in Computer Architecture

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Discuss the three classes of computers with their characteristics. **(06 Marks)**
b. Define module availability in terms of MTTE and MTTR. **(04 Marks)**
c. Explain the Amdahl's law. **(06 Marks)**
d We want to improve web servicing and instal a new processor which is ten times faster than original processor. Assuming that the original processor is busy with computation 40% of the time and is waiting for I/O 60% of the time, what is the overall speedup gained by incorporating the enhancement. **(04 Marks)**

2 a. What are the hazards in pipelining? **(06 Marks)**
b. Explain the four methods for reducing pipeline branch penalties. **(08 Marks)**
c. Explain the advantages and disadvantages of loop unrolling. **(06 Marks)**

3 a. Explain 2-bit dynamic branch prediction in ILP. **(04 Marks)**
b. Discuss salient features of dynamic scheduling using Tomasulo's approach. **(08 Marks)**
c. What should be the features of an ideal or perfect pipeline processor? **(08 Marks)**

4 a. Explain memory hierarchy in a computer system. **(04 Marks)**
b. Discuss the benefits of six basic cache optimizations. **(06 Marks)**
c. What is the utility of RAID? **(02 Marks)**
d. Explain the features of RAID levels 0 to 6. **(08 Marks)**

5 a. How do you detect and enhance loop level parallelism, with at least two examples. **(08 Marks)**
b. Explain in brief :
i) GCD test
ii) Software pipelining. **(12 Marks)**

6 a. Discuss the performance metrics for interprocessor communication. **(06 Marks)**
b. State the advantages of shared memory multiprocessor and of message passing multiprocessor. **(14 Marks)**

7 a. Explain the steps for floating point addition. **(08 Marks)**
b. What are the 3 techniques that are used for speeding up integer addition? **(06 Marks)**
c. Explain carry – look ahead techniques. **(06 Marks)**

8 Write short notes on :
a. Processor performance equation
b. Pentium and processor
c. Six basic cache optimization techniques
d. Queuing analysis of output system. **(20 Marks)**

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