G 6159

M.E. DEGREE EXAMINATION, MAY/JUNE 2007.

First Semester

Computer Science and Engineering

CS 1601 — COMPUTER ARCHITECTURE

(Regulation 2005)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State and give the significance of Amdahl's law.

2. What are the three popular choices for encoding the instruction set?

3. What is loop carried dependence?

4. What are the limitations in multiple issue processors?

5. What are poison bits? What is the use of it?

6. What are the various categories of cache misses.

7. What is spinlocks?

8. What is multiprocessor cache coherence?

9. Define snooping.

10. What is sequential consistency?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the concepts in measuring and reporting performance of a computer system. (6)

(ii) Discuss about the operands and operations for the media and signal processing. (6)

(iii) Suppose that we are considering an enhancement that runs 20 times faster than the original machine but is only usable 50% of the time. What is the overall speedup gained by incorporating the enhancement. (4)

Or

(b) (i) Explain the various addressing modes used. (8)

(ii) Describe the architecture of MIPS. (8)

12. (a) (i) Explain the concept of dynamic branch prediction. (8)

(ii) Explain the Tomasulo dynamic scheduling approach. (8)

Or

(b) (i) Describe control hazards in pipeline. (8)

(ii) Explain the classification of data hazards and discuss the compiler support for data hazards. (8)

13. (a) Discuss the various compiler technology for exploiting ILP. (16)

Or

(b) (i) What are the key ideas of hardware–based speculation? (4)

(ii) Discuss the advantages of hardware based speculation versus software based speculation. (12)

14. (a) (i) Explain the various types of storage devices. (8)

(ii) What are the various RAID levels? Explain. (8)

Or

(b) (i) Describe the designing issues of I/O system. (8)

(ii) Explain various techniques for reducing cache misses. (8)

15. (a) (i) What is barrier synchronization? Explain. (4)

  (ii) Explain various performance issues in multiprocessors. (12)

Or

  (b) (i) Discuss the various models of memory consistency. (12)

  (ii) Explain Flynn's taxonomy of computer architectures. (4)

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