Reg. No. :

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Sixth Semester

Computer Science and Engineering

CS 2354/CS 64/10144 CS 604 — ADVANCED COMPUTER ARCHITECTURE

(Regulation 2008/2010)

Time : Three hours                                    Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.  What are the possible types of data hazards?

2.  What do you mean by branch prediction buffer?

3.  What is VLIW?

4.  List out the major parts of Itanium processor?

5.  When is a memory said to be coherent in a multi-processor system?

6.  Why do we need Synchronization?

7.  Define the terms: access time, bandwidth

8.  State the principle of locality. List the types of locality.

9.  Write the benefits of multi-core architecture.

10. Why are design issues of SMT and CMP architectures important?

PART B — (5 × 16 = 80 marks)

11. (a) (i)  Explain the three types of dependencies in instructions.          (10)

    (ii) Explain the function of Tomasulo's approach                           (6)

Or

    (b) (i)  List out the decisions and transformation to be considered to obtain unrolled code in loop unrolling and scheduling.          (8)

    (ii) What is static branch prediction method? Explain its use.          (8)

12. (a) (i) Explain the problems with VLIW approach. (8)

    (ii) Describe about compiler speculation with hardware support. (8)

Or

(b) (i) Compare hardware with software speculation mechanisms. (8)

    (ii) Describe the various execution units in IA64 processors. (8)

13. (a) Explain the function of symmetric shared-memory architecture. Compare it with Distributed shared-memory architecture. (16)

Or

(b) (i) What is multithreading? Explain the approaches to multithreading. (8)

    (ii) Explain the models of memory consistency. (8)

14. (a) (i) Discuss the techniques for reducing cache miss penalty. (8)

    (ii) Briefly explain the types of storage devices. (8)

Or

(b) (i) Explain the various levels of RAID. (8)

    (ii) List and explain the various I/O performance measures. (8)

15. (a) (i) Describe the two levels of threads. (8)

    (ii) Discuss the factors that limits the issues in simultaneous multithreading. (8)

Or

(b) With a neat sketch, explain the architecture of IBM cell processor in detail. Highlight the features of it. (16)

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