

FACULTY OF INFORMATICS

B.E. 3/4 (IT) II-Semester (Supplementary) Examination, January 2013

Subject : Advanced Computer Architecture (Elective-I)

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART - A (25 Marks)

- 1. Sketch a block diagram to represent the architecture of a vector super computer. (2)
2. Illustrate detection of parallelism in a program using Bernstein's conditions. (3)
3. List some primitive operations for vector processors and symbolic processors. (2)
4. What are the forbidden latencies and the initial collision vector for the reservation table for a four stage pipeline with a clock cycle T = 20 m shown below. (3)

Table with 4 rows (S1-S4) and 6 columns (1-6) showing reservation table entries with 'X' marks.

- 5. Show how Butterfly network is a restricted subclass of omega networks. (3)
6. State and explain briefly any two context switching policies in multithreaded architectures. (2)
7. What is the purpose of loop parallelization? Give the two steps to perform loop parallelization. (3)
8. Describe parallel flow control. (3)
9. List parallel languages for parallel programming. (2)
10. How is asynchronous message passing achieved in Linda programming? (2)

PART - B (5x10=50 Marks)

- 11.(a) Illustrate the following: (5)
(i) Data dependence (ii) control dependence (iii) resource dependence
(b) Draw dependences graph and parallel execution flow using adders for the following instructions labeled p1, p2, p3, p4 and p5. (5)
p1 : C = D X E
p2 : M = G + C
p3 : A = B + C
p4 : C = L + M
p5 : F = G ÷ E
Assume each statement requires one step to execute.
12.(a) The performance of memory hierarchy is determined by the 'effective accesstime' at any level in the hierarchy, and depends on the 'nitrations' and 'access frequencies'. Explain. (5)
(b) Give a Hierarchy optimization model and explain. (5)
13.(a) Explain cache coherence problem. (5)
(b) Illustrate Snoopy Bus protocol. (5)
14. Describe in detail the share - variable model as a parallel programming model. (10)
15.(a) Explain synchronous message passing with special reference to Ada. (5)
(b) Illustrate Domain decomposition. (5)
16. Give SIMD machine model. Write vector instruction types along with examples. (10)
17. Write short notes on the following: (10)
(a) Conditions for parallelism
(b) Multithreading Issues and solutions
(c) Language features for parallelism

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