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NEW SCHEME

First Semester M.Tech. Degree Examination, Dec. 06 / Jan. 07
Computer Architecture

Time: 3 hrs.]

[Max. Marks:100

Note : Answer any FIVE full questions.

- 1 a. What are the elements of modern computer? Explain them with neat diagram. (10 Marks)
- b. With neat diagram describe the three shared memory multiprocessor models. (10 Marks)
- 2 a. With reference to the theoretical models of parallel computers define the following :
 i) Time complexity
 ii) Space complexity
 iii) Serial complexity
 iv) NP-class. (04 Marks)
- b. Explain the operational model of SIMD computer. (06 Marks)
- c. Consider the following pipeline reservation table
 i) What are the forbidden latencies
 ii) Draw the state transition diagram
 iii) List all simple and greedy cycle
 iv) Determine MAL
 v) Compute the throughput if $z = 20$ nsec.

		→ time							
		1	2	3	4	5	6	7	8
Stages	S ₁	X					X		X
	S ₂		X		X				
	S ₃			X		X		X	

(10 Marks)

- 3 a. What is data flow computers? What are the fundamental issues in multiprocessing? (04 Marks)
- b. Define the following :
 i) Static data flow
 ii) Dynamic data flow
 iii) Data flow graphs. (06 Marks)
- c. With neat diagram explain any one data flow machine. (10 Marks)
- 4 a. What are the main aspects of data dependencies? Explain them with example. (10.Marks)
- b. Explain the different decisions that are needed to the design layout of a pipeline (10 Marks)
- 5 a. With necessary diagram explain the functionality of ROB. (08 Marks)
- b. Describe the method of implementing the superscalar CISC using superscalar RISC core. (04 Marks)
- c. List and explain the different branch detection schemes. (08 Marks)

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- 6 a. What are the basic kinds of prediction of branches? Give comparison among them. (06 Marks)
- b. List the different methods of accessing the branch target path. Discuss them in brief. (08 Marks)
- c. With reference to speculativeness of branch prediction define the following with example :
- i) Level of speculativeness
 - ii) Degree of speculativeness. (06 Marks)
- 7 a. What is data parallel computation? What are the different connectivity concepts? Explain any two with necessary diagram. (10 Marks)
- b. What is vectorization? Explain how the computation can be speed up with vectorization. Discuss the effect of pipelining with vectorization. (06 Marks)
- c. List the facets of fine-grained and coarse-grained SIMD architectures. (04 Marks)
- 8 a. Briefly describe the design space systolic architecture. (10 Marks)
- b. Write note on :
- i) Power PC 620
 - ii) Cache coherence. (10 Marks)
