CBCS SCHEME

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15CS72

Seventh Semester B.E. Degree Examination, Feb./Mar.2022
Advanced Computer Architectures

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define computer architecture. Explain Flynn's classification with necessary diagrams. **(08 Marks)**

b. With a neat diagram, explain the vector super computer architecture. **(08 Marks)**

OR

2 a. With the necessary diagrams, explain the shared memory multiprocessors. **(10 Marks)**

b. What is data dependence? Define all five types of data dependence. **(06 Marks)**

Module-2

3 a. Explain the levels of parallelism in program execution on modern computers. **(10 Marks)**

b. What is mode duplication? With an example, explain the node duplication scheduling to eliminate communication delays between processors. **(06 Marks)**

OR

4 a. With diagrams, explain the pipelining in super scalar processors and VLIW processors. **(10 Marks)**

b. Explain the memory hierarchy technology. **(06 Marks)**

Module-3

5 a. With a neat diagram, explain backplane bus systems. **(06 Marks)**

b. With a neat block diagram, explain the C-access-interleaved memory organization which allows block access in a pipelined fashion. Also sketch the timing chart indicating the major and minor cycle time. **(10 Marks)**

OR

6 a. For the reservation table of a non-linear pipeline shown below:

	1	2	3	4	5	6
S_1	X				X	
S_2			X			
S_3		X		X		X

(i) Determine the forbidden latency set and initial collision vector.
(ii) Draw the state transition diagram.
(iii) List all simple cycles and greedy cycles.
(iv) Determine MAL. **(10 Marks)**

b. Differentiate between CSA and CPA adders. Design a pipeline unit for fixed-point multiplication of 8-bit integers using CSA tree. **(06 Marks)**

Module-4

7 a. Explain the routing in Omega networks of the multiprocessor system. **(10 Marks)**

b. Explain the snoopy bus protocol used to achieve data consistency among the caches and shared memory. **(06 Marks)**

OR

8 a. With necessary diagrams, explain the SCI Interconnect models. **(06 Marks)**

b. Define the following machine parameters to analyze the performance of network. **(04 Marks)**

c. Explain the following terms:

(i) Data flow graphs.

(ii) Pure data flow machines. **(06 Marks)**

Module-5

9 a. What are the characteristics of an object oriented programming model? **(10 Marks)**

b. Explain the functional and logic models in parallel models. **(06 Marks)**

OR

10 a. What is instruction level parallelism? Explain control dependence using code fragment. **(10 Marks)**

b. Explain the states in 2-bit prediction scheme used for dynamic branch prediction. **(06 Marks)**

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