

CBCS SCHEME

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

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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