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ENGINEERING ASSOCIATION'S
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COLLEGE OF ENGINEERING
LIBRARY, BIJAPUR.

15CS72

Seventh Semester B.E. Degree Examination, June/July 2019
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. Explain the evolution of computer architecture. (08 Marks)
- b. Explain with diagram the operational model of SIMD super computer. (08 Marks)

OR

- 2 a. Explain the Bernstein's conditions for parallelism. Detect the parallelism in the following code using Bernstein's conditions. (Assume no pipeline).
 $P_1 : C = D \times E$; $P_2 : M = G + C$; $P_3 : A = B + C$; $P_4 : C = L + M$; $P_5 : G \div E$. (08 Marks)
- b. With a diagram, explain the operation of tagged token data flow computer. (08 Marks)

Module-2

- 3 a. Distinguish between typical RISC and CISC process architectures. (08 Marks)
- b. With a diagrams, explain the models of a basic scalar computer system. (08 Marks)

OR

- 4 a. With a diagram, explain a typical superscalar RISC processor architecture consisting of an integer unit and a floating point unit. (10 Marks)
- b. With a diagram, explain the hierarchical memory technology. (06 Marks)

Module-3

- 5 a. Explain with diagram, the backplane bus specification. (08 Marks)
- b. With the diagrams, explain the central arbitration and distribution arbitration. (08 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			X	
S ₃			X			
S ₄				X		
S ₅		X				X

- i) What are the forbidden latencies? Write initial collision vector
- ii) Draw the state transition diagram
- iii) List all simple cycles and greedy cycles
- iv) Determine MAL. (10 Marks)
- b. Explain prefetch buffer and internal data forwarding mechanisms used in instruction pipelining. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. $42+8=50$, will be treated as malpractice.

Module-4

- 7 a. Explain crossbar networks and cross-point switch design in multiprocessor system. (08 Marks)
b. With necessary sketches, explain the cache-coherence problems in data sharing and in process migration. (08 Marks)

OR

- 8 a. With a diagram, explain the architecture of the connection machine CM-2. (08 Marks)
b. Explain the context-switching policies. (08 Marks)

Module-5

- 9 a. Explain the concurrent OOP and an actor model in object – oriented model. (08 Marks)
b. Explain the fairness policies and sole-access –protocols in the principles of synchronization. (08 Marks)

OR

- 10 a. What are the major hurdles of pipelining? Illustrate the branch hazards in detail. (08 Marks)
b. Explain the dynamic scheduling of a pipeline using Tomasulo's algorithm. (08 Marks)
