CBCS SCHEME

USN | | | | | | | | | | |

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)**

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)

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