

Roll No.....

Total Pages: 3
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MCA/M-18
ADVANCED COMPUTER ARCHITECTURE
Paper: MCA-14-42

Time: Three Hours

Maximum Marks: 80

Note: Attempt five questions including No. 1 which is compulsory. All questions carry equal marks.

Compulsory Question

1. Answer the following questions in brief :

- (a) What is basic block scheduling technique? Explain.
- (b) What is superscalar processor? Discuss the emergence of superscalar processor.
- (c) Explain COMA architecture.
- (d) What are locked, pending and split-transaction buses?

UNIT-I

- 2. (a) What is computational model? Compare object-based and dataflow computation models.
- (b) What is computer architecture? Explain multilevel hierarchical framework of computer architecture.
- 3. (a) What are data dependencies among instructions?
- (b) What is the difference between static and dynamic code scheduling? Explain global scheduling technique.

UNIT-II

- 4. (a) What is shelved issue? Explain it with suitable diagram.
- (b) Explain different techniques of preserving sequential consistency of instruction execution in superscalar processing.

- 5.(a) What is branch problem? Explain different dynamic branch prediction schemes.
- (b) What is branch penalty? Explain different techniques to reduce them.

UNIT-III

6. Write short note on :
- (a)UMA.
- (b)CC-NUMA.
7. What is direct interconnection network? Draw the diagram and compare the following topologies in terms of network diameter, bisection width node degree: linear array, star, 2D mesh with wrap around and hypercube.

UNIT-IV

8. (a) What is cache coherence problem? Explain hierarchical cache coherence protocol.
- (b) What are hardware-based cache coherence protocol with the help state-transition diagram.
9. (a) What is Omega network? What is hot spot problem in it? Discuss solutions in this problem.
- (b) What are centralized bus arbiter logic? Explain their working with suitable diagram relative pros and cons.