

B

Roll No.

Total Pages : 3

MCA/M-18

10512

ADVANCED COMPUTER ARCHITECTURE

Paper : MCA-14-42

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *five* questions in all. Question No. 1 is compulsory. Attempt *four* more questions selecting *one* question from each unit.

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 processors.
- (c) Explain COMA architecture.
- (d) What are locked, pended and split-transaction buses?

(4×4=16)

UNIT-I

2. (a) What is computational model? Compare Object-based and Dataflow computation models. 8
- (b) What is computer architecture? Explain multilevel hierarchical framework of computer architecture. 8

3. (a) What are data dependencies among instructions? Explain each with suitable examples. 8
- (b) What is the difference between static and dynamic code scheduling? Explain global scheduling technique. 8

UNIT-II

4. (a) What is shelved issue? Explain it with suitable diagram. 8
- (b) Explain different techniques of preserving sequential consistency of instruction execution in superscalar processing. 8
5. (a) What is branch problem? Explain different dynamic branch prediction schemes. 8
- (b) What is branch penalty? Explain different techniques to reduce them. 8

UNIT-III

6. Write short note on :
- (a) UMA. 8
- (b) CC-NUMA. 8
7. What is direct interconnection network? Draw the diagram and compare the following topologies in terms of network diameter, bisection width and node degree: linear array, star, 2D mesh with wrap around and hypercube. 16

UNIT-IV

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

