15/5/19

Roll No. .....1701904116..... Total Pages : 04

MCA/M-19 10512

ADVANCED COMPUTER ARCHITECTURE

MCA-14-42

Time : Three Hours] [Maximum Marks : 80

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory. Attempt *four* more questions, selecting *one* question from each Unit.

1. Answer the following questions in brief :
   (a) Explain different criteria to measure performance of a pipeline.
   (b) Explain parallel decoding task of superscalar processing.
   (c) Distinguish between shared memory MIMD and distributed MIMD architectures.
   (d) What are memory updation and cache coherence policies ? 4×4=16

Unit I

2. (a) What is Computation Model ? Compare von Neumann and Applicative computation models. 8

(b) What is Instruction-level Parallelism (ILP) ? What are different methods to exploit it ? 8

3. (a) What are hindrances to pipelines processing ? Explain them with examples. 8

(b) What is the difference between static and dynamic code scheduling ? Explain basic block scheduling technique. 8

Unit II

4. (a) What are fixed branch prediction schemes ? What are their limitations ? Explain. 8

(b) What is Multiway branching ? Explain pros and cons of this scheme. 8

5. (a) What is shelved issue ? How is it better than blocking issue ? Explain different types of shelving buffers. 8

(b) Compare VLIW and superscalar architectures. 8

Unit III

6. Write short notes on the following :

(a) COMA 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 : ring, tree, 2D mesh and hypercube. 16

Unit IV

8. (a) What is Cache Coherence Problem ? Explain directory based cache coherence protocols. 8

   (b) Write a short note on software-based cache coherence protocol. 8

9. (a) Explain construction and working of 8 × 8 Butterfly network with its diagram. 8

   (b) Explain decentralization rotating bus arbiter logic with the help of its diagram. 8