Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MCSE - 103

M.E./M.Tech., I Semester

Examination, June 2016

Advanced Computer Architecture

Time : Three Hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks.

1. a) Discuss the Flynn's classification scheme of computer architecture. 7
   b) Describe the following terminology associated with pipeline computers : 7
      i) Simple cycle
      ii) greedy cycle
      iii) Forbidden latency
      iv) Bottleneds

2. a) Describe the various shared memory multiprocessors. 7
   b) Consider the execution of a program of 15,00,000 instructions by a linear pipeline processor with a clock rate of 1000 MHz.
      i) Calculate the speed up factor in using pipeline as compared with an equivalent non pipelined processor.
      ii) What are the efficiency and though put of pipelined processor. 7

3. a) Explain the parallel bubble sort algorithm using ınterconnection network. Also gives its time complexity to sort the elements. 7
   b) Explain internal data forwarding and possible hazards between read and write operation with respects to mechanism for instruction pipeline. 7

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4. a) Explain the following terminology associated with SIMD computers : 7
      i) Lock-step operation
      ii) Masking of processing elements
      iii) Shuffle exchange functions
      iv) Recalculating Networks
   b) Explain the difference among UMA, NUMA, COMA and NORMA architecture. 7

5. a) Explain the temporal locality, spatial locality and sequential locality associated with program/data access in a memory hierarchy. 7
   b) How can air-traffic simulation be done on a multicomputer system, using decomposition technique? 7

6. a) Explain multiprocessing in MIMD mode and multiprocessing in MPMD mode. 7
   b) Explain the parallel algorithm for array processors. 7

7. a) What is cache coherence? Explain the various protocols of cache coherence. 7
   b) What are the types of operating systems used for parallel processing? How they are different from the normal OS. 7

8. Write short notes on any three of the following : 14
   a) Bitonic merge sort
   b) Remote procedure call
   c) Vector processor
   d) Scheduling and local balancing in multiprocessor
   e) Dynamic interconnections

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