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SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act,1956)

Course & Branch :M.E - AEL/W-AEL Max. Marks:80
Title of the Paper :Computer Architecture and Parallel Processing
Sub. Code :SCSX5035 (2010-11) Time : 3 Hours
Date :13/12/2011 Session :FN

PART - A (6 x 5 = 30)

Answer ALL the Questions

1. Briefly explain the different computational granularities or levels of parallelism in program execution.

2. Draw and explain the two virtual memory models of multiprocessor systems.

3. Give an account of cache performance design issues.

4. Write an algorithm for SIMD matrix multiplication and explain.

5. Demonstrate the communication between the producer and consumer processes with finite buffer.

6. Brief the issues which are relevant in time synchronization and space synchronization of communicating processes for a synchronization network.

PART – B (5 x 10 = 50)

Answer ALL the Questions

7. Briefly discuss the dynamic connection networks.

(or)

8. Describe the PRAM model of a multiprocessor system and write a PRAM matrix multiplication algorithm.

9. Briefly write about prefetch buffers, multiple functional units, internal data forwarding and hazard avoidance mechanisms of instruction pipelining.

(or)

10. Explain the fundamental structure of a superscalar pipeline and superscalar architecture for a RISC processor with diagrams.

11. (a) Briefly explain the static interconnection network topologies with diagram.
(b) Define and explain the shuffle-exchange and Omega networks.

(or)

12. Describe the functional organization of an associative array processor with an example.

13. Explain the loosely coupled and tightly coupled multiprocessor systems.

(or)

14. (a) Narrate the deadlock problem with an example.
(b) Give short notes on synchronous and asynchronous parallel algorithms.

15. Describe the mechanisms which can be used to implement various synchronization methods for concurrent processes.

(or)

16. Describe the decomposition techniques based on data domains, control structures and functionality concepts.