Register Number……

B.E. DEGREE EXAMINATIONS: APRIL/MAY 2012

Eighth Semester

COMPUTER SCIENCE AND ENGINEERING

U07CSE15: Parallel Computing

Time: Three Hours **Maximum Marks: 100**

Answer All Questions:-

PART A (10 x 1 = 10 Marks)

1. In _____ machine, different instructions can be executed at the same cycle.
   A) MIMD B) SISD C) SIMD D) SPMD
2. In _____ mode, a user program has exclusive use of its needed resources
   A) Batch B) Preemptive C) dedicated D) Time sharing
3. _____ architecture combines the advantages of various design architectures in a microchip.
   (A) Superscalar B) Super pipelined C) CISC D) Decouple
4. _____ models use buffering and pipelining of memory reference operations.
   A) Prefetch Technique B) Distributed Coherent cache
   C) Relaxed memory consistency D) Multiple context processor
5. The _____ architecture extends from the mesh by having wraparound connections that combines the advantages of ring and mesh.
   A) Mesh B) Illiac Mesh C) 2-D Torus D) Systolic Array
6. _____ problem occurs when a low-priority process is preempted while holding a lock needed by a higher priority process.
   A) Convoying Blocking B) Non- serializabilit
   C) Priority Inversion D) Locking Overhead
7. _____ programs cannot be directly executed on a multicomputer.
   A) Shared Variable B) Message Passing C) Data parallel D) Implicit Parallel
8. A program is _____ if, for any initial data state, there is only one final data state.
   A) Terminative B) Determinate C) Compositional D) Structure
9. _____ is executed when a process reaches it, without waiting for a corresponding send.
   A) Blocking send B) Blocking receive C) Non-blocking send D) Non-blocking receive

10. Using TCP requires establishing up to _____ connections for a n-node virtual machine

A) n B) n(n-1) C) n+1 D) n(n-1)/2

PART B (10 x 2 = 20 Marks)

11. List the features of Massively Parallel Processors.
12. Define aggregation?
13. What is the main advantage of decoupled architecture?
14. What is multithreaded latency hiding?
15. Mention the advantages of thread operations over process operations.
16. Which of the switched interconnects is expensive? Justify your answer.
17. What do you mean by shared memory?
18. Compare the advantages of using OpenMP standard over existing parallel programming standards.
19. List out the communication modes used in message passing systems.
20. Draw the Parallel Virtual Machine generic TID format and mention its attributes.

PART C (5 x 14 = 70 Marks)

21. a) (i) Briefly explain the typical architecture of a cluster of multiple computers (7)

(ii) Compare the features of cooperative and competitive parallel programs. (7)

(OR)

b) (i) Discuss the various issues arising from the specification of parallelism in user programs. (7)

(ii) Solve the problem of inner-product using BSP machine model. (7)

22. a) (i) Explain the instruction execution on a Pentium Processor with neat diagrams. (7)

(ii) Define cache coherence problem? Write briefly about the sources of incoherence. (7)

(OR)

b) (i) Discuss the machine parameters used to analyze of performance of Multithreaded Processor model (7)

(ii) With a neat diagram explain the state transition diagram of the MESI Snoopy Protocol (7)

23. a) (i) How do you assess the performance of a network? Describe briefly the various aspects of the performance metrics. (7)

(ii) Explain the thread concepts involved in Solaris threads with neat diagrams. (7)

(OR)

b) (i) Show the possible connections of a 2 x 2 switch used in constructing the Omega network by a neat diagram. Design an 8 x 8 Omega network using three stages of 2 x 2 switches (7)

(ii) List out the drawbacks of mutual exclusive locking techniques (7)

24. a) (i) Briefly discuss the various parallel algorithmic paradigms.

(OR)

b) (i) Discuss the techniques used to eliminate data dependency. (7)

(ii) Explain the basic thread management and synchronization of POSIX Thread model. (7)

25. a) Describe the communication modes to demonstrate message passing using examples and compare them

(OR)

b) (i) Explain the features of MPI-2 with suitable examples.

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