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## CS 6/73201

## Exam #1

Advanced OS

## Wednesday 24 February 1999

- 1. Most computer systems discussed in this class are MIMD computers.
  - a. What is a "MIMD" computer? (Explain more than just the acronym.) (6 points)

b. Are MIMD computers parallel or distributed machines? Explain your answer. (10 points)

- 2. The Internet Protocol (IP) is a very common protocol for communication at the network layer.
  - a. What are the main responsibilities of this protocol / layer? (7 points)

b. In what ways is IP "unreliable", and how is this unreliability overcome? (7 points)

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- 3. An important consideration in implementing message passing is the size of the buffer.
  - a. Is it possible to have a buffer of zero capacity, and if so, what are the advantages and disadvantages of this method? (6 points)

b. Is it possible to have a buffer with single-message capacity, and if so, what are the advantages and disadvantages of this method? (6 points)

4. List, and briefly explain, some of the issues that are handled by an RPC mechanism, that would otherwise have to be handled by the programmer if message-passing were used instead. (15 points)

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5. What are the (i) advantages and (ii) disadvantages of user-level threads over kernel-level threads? (15 points)

6. What purpose does the ORB serve in a CORBA system? (8 points)

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7. Explain the difference between a symmetric multiprocessor (SMP) (an UMA machine) and a distributed shared memory (DSM) system, in terms of (i) overall architecture, (ii) access of each processor to memory, and (iii) caching. (20 points)