

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

# GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-II Examination July 2010

Subject code: 720201

Subject Name: Distributed Operating System

Date: 05 /07 /2010

Time: 11.00am – 1.30pm

Total Marks: 60

## Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain distributed computing model. **06**  
(b) 1. Increasing replica in a Distributed operating system will improve the overall performance of the system? Justify your answer with relevant example. **02**  
2. Explain polling and Interrupt in message passing and explain any one algorithm for the same. **04**
- Q.2** (a) Design a four way hand shaking protocol for message passing that reduce the communication overhead and increase performance compare to four way handshake message passing protocol in network operating system. **06**  
(b) Explain desirable features of Process migration in Distributed Operating system **06**
- OR**
- (b) Design a distributed algorithm for multiple producers and multiple consumer problems that have to be implemented in network operating system environment to achieve transparency and consistency like Distributed operating system. **06**
- Q.3** (a) Explain Distributed clock synchronization algorithm. **06**  
(b) Explain the requirement of cooperative load sharing approach or load balancing approach? Give an example that specifically requires cooperative approach? **06**
- OR**
- Q.3** (a) Explain distributed algorithm for Deadlock detection and prevention **06**  
(b) 1. What is false sharing in a DSM system? When is it likely to occur? **03**  
2. What are the main causes of thrashing in a DSM system? **03**
- Q.4** (a) Explain Strict Consistency model? If we want to implement the model in real life what modifications are required? Make suitable assumption. **06**  
(b) What trend are modern distributed file systems following for kernel design? **06**  
What are the main reasons for using this approach?
- OR**
- Q.4** (a) 1. Most DSM systems in which caching is managed by the operating system, use the write invalidate scheme for consistency instead of the write-update scheme. Explain why. **03**  
2. Differentiate between PRAM consistency and processor consistency. **03**  
(b) Describe the process model of Amoeba. **06**
- Q.5** (a) 1. In what aspects is the design of a distributed file system different from that of a file system for a centralized time sharing system? **04**

2. When file system replicates files, they do not replicate all files. Give an example of a kind of file that is not worth replicating. **02**
- (b)** 1. Discuss the relative advantages and disadvantages of using full-file caching and block caching models for the data-caching mechanism of a distributed file system. **03**
2. In the design of distributed file system, high performance and high reliability are conflicting properties. Discuss. **03**

**OR**

- Q.5** **(a)** 1. Discuss disadvantages of stateful file servers. Give an example, where it might be necessary to use stateful file servers. **03**
2. Replication and caching – both concepts are not required in the same distributed system. Is the statement True or False? Justify your answer. **03**
- (b)** 1. When session semantics are used, it is always true that changes to a file are immediately visible to the process making the change and never visible to processes on other machines. Is the statement True or False? Justify your answer. **02**
2. In the design of distributed file system, high availability and high scalability are mutually related properties. Discuss. **04**

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