Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**B.E. - SEMESTER – VIII EXAMINATION – OCTOBER 2012**

**Subject code: 180701** **Date: 27/10/2012**

**Subject Name: Distributed Systems**

**Time: 02.30pm - 05.00pm** **Total Marks: 70**

## Instructions:

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

| | | | |
|---|---|---|---|
| Q.1 | (a) | i) What is a distributed system? How a distributed system projects a single system image? | 02 |
| | | ii) Why network system protocols are unsuitable for distributed systems? | 02 |
| | | iii) What is the main difference between stateless and stateful servers? Which servers are used in distributed applications? | 03 |
| | (b) | i) State the relative merits and demerits of the various process addressing mechanisms. | 03 |
| | | ii) Distinguish different RPC communication protocols. Suggest one example where each protocol is used. | 04 |
| Q.2 | (a) | Discuss briefly the various issues related to distributed system design. | 07 |
| | (b) | What is ordered message delivery? Compare the various ordering semantics for message-passing. Explain how each of these semantics is implemented. | 07 |
| | | **OR** | |
| | (b) | What is RMI? What are the main features of Java RMI? Discuss the various components and the process of RMI execution. | 07 |
| Q.3 | (a) | Enumerate the various issues in clock synchronization. Classify the clock synchronization algorithms and explain Berkeley algorithm with an example. | 07 |
| | (b) | i) What is logical clock? Discuss its significance in a distributed system. | 03 |
| | | ii) Explain how logical clocks are implemented in a distributed system | 04 |
| | | **OR** | |
| Q.3 | (a) | Why mutual exclusion is more complex in distributed systems? Categorize and compare mutual exclusion algorithms. | 07 |
| | (b) | i) What is a deadlock? List the four necessary and sufficient conditions for a deadlock to occur. | 03 |
| | | ii) Discus various deadlock prevention strategies. | 04 |
| Q.4 | (a) | Discuss the issues in designing load balancing algorithms. | 07 |
| | (b) | What is process migration? What are the main steps involved in process migration? Explain how freezing of the migrating process is carried out. | 07 |
| | | **OR** | |
| Q.4 | (a) | Discuss the issues in designing the DSM systems. | 07 |
| | (b) | What are threads? Enumerate the major differences between threads and processes. Discuss thread synchronization. | 07 |
| Q.5 | (a) | What is object location? How is it carried out in a distributed system? Discuss various object-locating mechanisms. | 07 |
| | (b) | How the problem is specified using formal model? Specify the problem of mutual exclusion using formal model specification | 07 |
| | | **OR** | |
| Q.5 | (a) | Describe the basic concepts related to object naming in distributed systems. | 07 |
| | (b) | How the process is specified using formal model? Define the process execution and admissibility using formal model specification. | 07 |

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