Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME- SEMESTER II– EXAMINATION – SUMMER 2015

Subject Code: 2720207 **Date: 28/05/2015**

Subject Name: Distributed Computing and Applications

Time: 2:30 PM – 5:00 PM **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Discuss the relative advantages and disadvantages of workstation-server model and processor-pool model used to configure distributed computing systems.	**07**
	(b)	1. Mention the differences between distributed system and parallel system.	**04**
		2. Explain bind() function with respect to network programming using sockets.	**03**
Q.2	**(a)**	What is the significance of buffering strategy in message passing? Discuss different types of buffering strategies in detail.	**07**
	(b)	Write a client-server program using socket programming for following problem description: The client sends the server a one-byte message that contains either the command '0' or the command '1'. On receiving message '0', the server executes the Unix 'ls' command and returns the result. On receiving message '1', the server executes the Unix 'date' command and returns the result. The server terminates after executing the command and client terminates after printing the result on the screen.	**07**
		OR	
	(b)	What is idempotent operation? Discuss with example that how *exactly-once semantics* is useful to avoid 'orphan' executions that are resulted if the execution of the request is nonidempotent.	**07**
Q.3	**(a)**	Discuss lightweight RPC in brief.	**07**
	(b)	Discuss design issues of RMI.	**07**
		OR	
Q.3	**(a)**	Discuss two types of complicated RPCs in detail.	**07**
	(b)	1. Which are the factors that influence the selection of block size in the design of a Distributed Shared Memory.	**04**
		2. What are the differences between RMI and RPC.	**03**
Q.4	**(a)**	Discuss the issues which must be addressed while memory-blocks are to be dynamically migrated/replicated in distributed shared memory.	**07**
	(b)	Externally synchronized clocks are also internally synchronized, but the converse is not true. Explain why? Discuss implementation of logical clocks using counters.	**07**
		OR	
Q.4	**(a)**	Discuss token-passing approach to achieve mutual exclusion in distributed systems.	**07**
	(b)	Explain pretransferring mechanism for transferring address space with its advantages and disadvantages.	**07**
Q.5	**(a)**	1. Which are the various security threats in computer systems.	**04**
		2. Briefly explain SOAP.	**03**

	(b)	Suppose you have to design a load sharing algorithm for a distributed system. Will you prefer to use a sender-initiated or a receiver-initiated location policy in your algorithm? Give reasons for your answer.	**07**

OR

Q.5	**(a)**	Explain functioning of two-phase commit protocol.	**07**
	(b)	Briefly discuss byzantine generals problem in synchronous system. Give its solution with one faulty process.	**07**

****