

Reg. No.



**Manipal Institute of Technology**  
(A Constituent Institute of Manipal University)



**II SEMESTER MCA  
END SEMESTER EXAMINATION – MAY 2016**

**SUBJECT: DISTRIBUTED COMPUTING SYSTEMS [MCA 5002]**

14-05-2016

Time : 3 hours

Max. Marks : 50

**Instructions to Candidates**

1. Answer ANY FIVE FULL questions.
2. Missing data may be suitably assumed.

- 1A Explain RMI implementation of distributed object model.
- 1B List out different distributed system you are aware and explain any two in brief.
- 1C Explain any following transparencies in the context of designing distributed system.  
(5 + 3 + 2)
- 2A Explain various failure models of distributed system.
- 2B Compare the mobile code and the thin client variants of client-server model.
- 2C Describe the architectural model of the distributed system.  
(5 + 3 + 2)
- 3A Write a UDP based client-server java program to send an integer from client and the server has to check the received integer is prime or not and send the message back to the client.
- 3B Compare UDP and TCP based inter-process communication in distributed system.
- 3C List out the characteristics of TCP stream abstraction.  
(5 + 3 + 2)
- 4A Compare external and internal synchronization of physical clock. Explain three modes of NTP time synchronization.

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- 4B What are the advantages of distributed module interface?
- 4C Compare at-least-once and at-most-once invocation semantics of distributed object model. (5 + 3 + 2)
- 5A Discuss various design issues of distributed object model and invocation semantics of distributed object model.
- 5B Compare process and threads in the context of distributed operating system.
- 5C Consider request processing time of 2ms and I/O delay time of 4ms. How many requests can be processed by two threads with 50% caching hit rate? (5 + 3 + 2)
- 6A Explain file service architecture in distributed system.
- 6B What is the problem with Lamport's logical clock? How vector clock overcome this problem?
- 6C What the requirements of replication of data in distributed system? (5 + 3 + 2)