Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

I SEMESTER M.Tech (CSIS) DEGREE

END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: DISTRIBUTED COMPUTING SYSTEMS (CSE-521)

REVISED CREDIT SYSTEM

Time: 3 Hours 01-12-2015 MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.
- Missing data, if any, may be suitably assumed.

1A. Explain the following transparencies with respect to distributed system.
i) Access transparency ii) Replication Transparency iii) Failure Transparency **5M**

1B. Discuss a method to create a unique remote object reference. **3M**

1C.Why might the number of messages exchanged in a protocol be more significant to performance than the total amount of data sent? **2M**

2A.With an architecture diagram explain the role of different modules in remote procedure call. **5M**

2B.With a diagram explain how DNS organizes name servers for resolving the names**.** **3M**

2C. A client makes remote procedure calls to a server. The client takes 5 milliseconds to compute the arguments for each request, and server takes 10 milliseconds to process each request. The local operating system processing time for each send or receive operation is 0.5 milliseconds, and the network time to transmit each request or reply message is 3 milliseconds. Marshalling or unmarshalling takes 0.5 milliseconds per message. Calculate the time taken by the client to generate and return from two requests if it is single threaded, and if it has two threads that make requests concurrently on a single processor. **2M**

3A. Briefly explain the implementation of sequential consistency model in a distribute shared memory using replicated migrating block strategies. **5M**

3B. Briefly explain the different techniques used in the distributed system to know the end points of a service by the clients. **3M**

3C. Imagine a Web server that maintains a table in which client IP addresses are mapped to the most recently accessed Web pages. When a client connects to the server, the server looks up the client in its table, and if found, returns the registered page. Is this server stateful or stateless? Give reason. **2M**

4A. With a diagram explain a Token ring Algorithm for mutual exclusion . **5M**
4B. With diagram explain how Network Time Protocol is used to maintain synchronization between a host and a time server. **3M**
4C. Suppose that two processes detect the demise of the coordinator simultaneously and both decide to hold an election using the bully algorithm. What happens? **2M**

5A.With a diagram explain monotonic write client centric consistency model. **5M**
5B. Explain following types of update propagation with replicas **5M**
i) Propagate only notification of an update ii) Propagate the update operation. **3M**
5C.When using a lease, is it necessary that the clocks of a client and the server, respectively, are tightly synchronized? **2M**

6A.With state diagrams, explain the Three-Phase Commit protocol **5M**
6B.With a diagram explain a method to digitally sign a message using a message digest. **3M**
6C.With a diagram explain how mutual authentication is done in a public-key crypto system. **2M**