(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2715 **Roll No.** | | | | | | | | | | |

B. Tech.

(SEM. VII) ODD SEMESTER THEORY EXAMINATION 2012-13

DISTRIBUTED SYSTEMS

Time : 3 Hours *Total Marks : 100*

Note :– (i) **All** questions are compulsory.

(ii) All questions carry equal marks.

1. Attempt any **two** parts of the following :– **(10×2=20)**

   (a) Discuss the relative advantages and disadvantages of the various commonly used models for configuring distributed computing systems.

   (b) Discuss the major issue in designing a distributed system.

   (c) How Lamport clock casually relate two events ? Discuss the limitations of lamport clock. How the vector clocks remove the limitations of Lamport clock ? Explain.

2. Attempt any **two** parts of the following : **(10×2=20)**

   (a) What is deadlock ? What are the necessary conditions for the occurrence of deadlock in distributed system ? Describe the deadlock handling strategies in distributed system.

(b) Classify the Deadlock detection algorithms. Describe the Path-Pushing deadlock detection algorithm.

(c) Write and explain a token based algorithm for mutual exclusion. Describe its performance on important metrics.

3. Attempt any **two** parts of the following : **(10×2=20)**

(a) Describe Byzantine agreement problem, and explain its solution. Show that Byzantine agreement cannot always be reached among four processors if two processors are faulty.

(b) Describe mechanism for building distributed file system. Explain data access actions in distributed file system.

(c) Discuss the architecture of distributed shared memory and its advantages.

4. Attempt any **two** parts of the following : **(10×2=20)**

(a) What is livelock problem in message passing system ? How the synchronous checkpointing methods avoid the livelock problem ? Describe.

(b) Describe two phase commit protocol. How the protocol handles the site failure ? Write and explain its limitations.

(c) What do you understand by dynamic voting ? Explain dynamic voting protocol in brief.

5. Write short notes on any **two** of the following : **(10×2=20)**

(a) (i) Briefly explain the objectives of distributed transaction management.

(ii) What is lock ? Describe the functions of lock manager.

(b) (i) Describe how a non recoverable situation could arise if write locks are released after the last operation of a transaction but before its commitment.

(ii) Draw a schematic diagram of the distributed transaction management model. Explain each component in brief.

(c) (i) Define and differentiate the simple and nested distributed transactions.

(ii) What is atomic commit protocol ? Explain in brief.