

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

PAPER ID : 2715

Roll No.

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B.Tech.

(SEM. VII) ODD SEMESTER THEORY

EXAMINATION 2013-14

DISTRIBUTED SYSTEMS

Time : 3 Hours

Total Marks : 100

Note :- (1) All questions are compulsory.

(2) All questions carry equal marks.

1. Attempt any **four** parts of the following : **(5×4=20)**

- (a) How the distributed computing system is better than parallel processing system ? Explain.
- (b) Discuss the impact of the absence of global clock in distributed systems.
- (c) Define the term transparency. Explain important types of transparencies in distributed system.
- (d) What is termination detection in distributed system ? Explain any algorithm for termination detection.
- (e) What is Vector Clock ? How this maintains causal ordering ? Explain.

- (f) Explain the following Distributed Computing Model :
- (i) Mini Computer Model
 - (ii) Work Station Model
 - (iii) Work Station Server Model.
2. Attempt any **two** parts of the following : **(10×2=20)**
- (a) What is Mutual Exclusion ? Describe the requirements of mutual exclusion in distributed system. Is mutual exclusion problem more complex in distributed system than single computer system ? Justify your answer.
 - (b) What do you mean by deadlock avoidance ? Explain in brief. Describe Edge-Chasing deadlock detection algorithm.
 - (c) Write and explain a non token based mutual exclusion algorithm. Describe its merit and demerits.
3. Attempt any **two** parts of the following : **(10×2=20)**
- (a) Classify the agreement problems. Explain the applications of agreement algorithms.
 - (b) Write and explain various issues that must be addressed in design and implementation of distributed file system.
 - (c) Describe memory coherence. Briefly explain the write invalidate and write update protocols.
4. Attempt any **two** parts of the following : **(10×2=20)**
- (a) What is checkpointing in message passing system ? Explain the recovery in message passing system using asynchronous checkpointing scheme.

- (b) (i) Define the livelocks. What is the difference between a deadlock and livelock ?
- (ii) Show that when checkpoints are taken after every $K(K>1)$ message sent, the recovery mechanism suffers from the domino effect. Assume that a process takes a checkpoint immediately after sending the K^{th} message but doing anything else.
- (c) Describe three phase commit protocol. How three phase commit protocol is different than two phase commit protocol ?
5. Write short notes on any **four** of the following :

(10×2=20)

- (a) Describe the advantages and disadvantages of multiversion time stamp ordering over the ordinary time stamp ordering.
- (b) Describe the optimistic concurrency control method. How this method avoids the drawbacks of locking ? Explain.
- (c) (i) What is Phantom Deadlock ? Describe the conditions for the occurrence of phantom deadlock.
- (ii) Describe the architecture of replicated transactions.