



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

PAPER ID : 214433

Roll No.

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**MCA**  
**(SEM. IV) THEORY EXAM. 2014-15**  
**DISTRIBUTED SYSTEM**

Time : 3 Hours]

[Total Marks : 100

**Note :** Attempt the questions as indicated.

**Q1.** Attempt any *two* questions from the following : 10x2=20

- (a) Compare the characteristics of a central database and distributed database over a network. List and explain in brief five problems in distributed database system.

- (b) What do you mean by multidatabase system? Explain in brief and also compare the two-tier and three-tier client architecture.
- (c) Explain how the two-phase protocol for nested transactions ensure that if the top level transaction commits, all the descendants are committed or aborted.

**Q2.** Attempt any *two* questions from the following :  $10 \times 2 = 20$

- (a) What are the distributed database? What are the advantages of data distribution and data replication?
- (b) Write and explain the characteristics of query processors.
- (c) What do you mean by fragmentation? Explain horizontal and vertical fragmentation with example.

**Q3.** Attempt any *two* questions from the following :  $10 \times 2 = 20$

- (a) Define recoverable schedule. Why is recoverability of schedules desirable? Explain it with suitable example.

- (b) Write short notes on distributed serializability and objectives of data distribution.
- (c) Discuss the multiversion timestamp ordering algorithm. What are the advantages and disadvantages of this algorithm?

**Q4.** Attempt any *two* questions from the following : 10x2=20

- (a) Discuss how a unique global timestamp is generated in a distributed system. Discuss the lost update and dirty read anomaly.
- (b) Under which situation will it be beneficial to have replication or fragmentation of data? Describe the correctness rules that must be considered during data fragmentation.
- (c) Differentiate between short duration and long duration transaction with suitable example. Explain homogeneous and heterogeneous distributed database system.

**Q5.** Attempt any *two* questions from the following : 10x2=20

- (a) Describe 2-phase commit protocol with the state transition diagram for it. What are the demerits of this protocol?
- (b) Generate an algorithm for synchronous check pointing in a distributed database system.
- (c) Discuss the-objectives of distributed query processing. Explain the various phases in distributed query processing in detail.