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

PAPER ID : 2148 Roll No. | | | | | | | | | | |

MCA.

(SEMESTER-V) THEORY EXAMINATION, 2012-13

ADVANCE DATABASE MANAGEMENT SYSTEMS

Time : 3 Hours] *[Total Marks : 100*

Note : Attempt questions from each Section as indicated.

Section – A

1. Attempt **all** parts : **2 × 10 = 20**

   (a) Discuss Semi Join.

   (b) Define check point and its impact on data base recovery

   (c) Explain Two-Phase Locking Method

   (d) What is a view ? How it is related to data independence ?

   (e) What is distributed database system ? Also discuss about distributed query processing.

   (f) How does the recovery manager ensure atomicity of transactions ? How does it ensure durability ?

   (g) What is a transaction ? What are different phases of transactions ?

   (h) What do we mean by conflict equivalent conflict serializable and strict schedule ?

   (i) What are the various states through which a transaction passes through in its lifetime ? Briefly discuss all the states.

   (j) How eager replication system is different than lazy replication in terms of detecting the replication conflict in distributed database systems.

Section – B

2. Attempt any **three** parts : **10 × 3 = 30**

   (a) Discuss the problem which may arise during concurrency control and recovery in distributed databases which are not encountered in centralized database environment.

(b) What is scheduler ? Explain its functions.

(c) Explain the need for two-phase commit protocol Further, describe the two phases.

(d) Compare the two log-based recovery schemes in terms of ease of implementation and overhead cost.

(e) What is the objective of query processing functions in distributed database ? Also discuss characteristics and classifications of query processing.

Section – C

Attempt any **five** questions. **10 × 5 = 50**

3. Discuss deadlock in distributed database system using an example Explain three algorithms widely used in deadlock detection in distributed database systems.

4. Consider three transactions T_1, T_2 and T_3 Draw the precedence graph for the following schedule consisting of these three transactions and determine whether it is serializable. If so, give its serial order(s).

Time	T_1	T_2	T_3
t_1 :			read(Y)
t_2 :			read(Z)
t_3 :	read(X)		
t_4 :	write(X)		
t_5 :			write(Y)
t_6 :			write(Z)
t_7 :		read(Z)	
t_8 :	read(Y)		
t_9 :	write(Y)		
t_{10} :		read(Y)	
t_{11} :		write(Y)	
t_{12} :		read(X)	
t_{13} :		write(X)	

5. Explain how log is useful for crash recovery Discuss the actions for which log record is written Apart from log, elaborate two tables which are helpful for crash recovery.

6. Check the following schedules for these properties : Recoverable, Cascadeless, and Strict i e. identify whether following schedules are recoverable, Cascadeless, and strict or not Here R. W, c. and a stands for read, write, commit, and rollback respectively

   a. R1(A); W1(A); R2(A); R1(B); W2(A); c2; a1;

   b. R1(A); W1(A); R2(A); R1(B); W2(A); W1(B); c1; c2;

   c. R1(A); W1(A); R2(A); W2(A); R1(B); W1(A); a1; a2;

   d. R1(A); W1(A); W2(A); R1(B); R3(C); W1(A); a1; R2(A); c2; c3;

   e. R1(A); R2(A); W1(A); c1; W2(A); a2

7. Discuss different types of distributed databases and list few properties, which are desirable while making the impact of data distribution transparent in distributed database systems Also discuss three different widely used distributed database architectures.

8. Discuss :

   (a) Timestamp-based concurrency control.

   (b) Multiple-granularity locking.

9. (a) Discuss recoverable schedule and cascadeless schedule.

   (b) Consider the following two transactions :

   T1 : read (A);

   read (B);

   B = A+ B;

   write (B)

   T2 : write (A)

   read (B)

   Add lock and unlock instructions so that the transaction T1 and T2 observe two-phase locking protocol. Is it deadlock free ?
