Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/MCA/SEM-5/MCAE-501A/2010

2010

DISTRIBUTED DATABASE MANAGEMENT SYSTEM

Time Allotted : 3 Hours | Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) DDBMS provide better ..... , ... and ..... over centralized DBMS.

a) Reliability b) Availability

c) Security d) Transparency.

ii) One of the popular DDBMS product is

a) DB2 b) Oracle

c) ZZQ d) R* .

iii) "Fragmentation transparency cannot be achieved without location transparency." The statement is

a) True b) False

c) Unknown d) None of these.

iv) Global Schema, Fragmentation Sceme and Allocation Schema reside

a) in one of the machine elected as a coordinator of the DDBMS

b) virtually in the system

c) in all the machines of the DDBMS network

d) all of these.

v) Which component has the right to communicate distributed information with another component of different machine for running distributed transaction correctly ?

a) Root agent

b) DTM

c) LTM

d) None of these.

vi) Heterogeneous data source need ..... design for designing D-DBMS.

a) Bottom-up

b) Top-down

c) Flat

d) None of these.

vii) 3PC protocol ensures non-blocking in case of ..... failure.

a) Site

b) Network

c) Partition

d) Co-ordinator.

viii) The horizontal fragmentation of a relation cannot be based on a property of its own attributes, but is derived from the horizontal fragmentation of another relation is called ..... fragmentation.

a) horizontal

b) vertical

c) mixed

d) derived horizontal fragmentation.

ix) Is determination of consistent view of the network has the same complexity as determination of network failure ?

a) Yes b) No

c) Unknown d) Possible.

x) Are distributed systems like SDD1, R* , DDM, D-INGRES, POREL and SIRIUS-DELTA support ..... fragmentations.

a) horizontal b) vertical

c) derived d) mixed.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 ∞ 5 = 15

2. "High Reliability does not ensure correctness of the Distributed system." Comment critically.

3. Consider the following relation algebra. :

π_{cname} (σ_{mgrno} = 374 (EMP dno = dno DEPT)-

(σ_{mgrno} = 374 AND sal >= 35000 (EMP ⋈ dno = dno Dept)

The above expression generate names of the employee whose salary are less than 35000 and manager number is 374. Draw operator tree of the above algebraic expression and optimize it into the highest level.

4. "2PL protocol only ensure that the schedule is conflict serializable or not ; but it cannot generate all possible combination of valid serializable schedule." Comment critically with example.

5. Explain unilateral abort capability in the context of 2-phase commitment protocol.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \infty 15 = 45$

6. a) Discuss drawbacks of 2PC protocol in distributed system with an example. 4

   b) Is 3PC protocol resolves all the problems ? Discuss 3PC protocol with the help of state transition diagram. 8

   c) Is 3PC will work in case of partition (type of failure) of network ? If not, discuss an algorithm that work in case of partition ? 3

7. a) Draw the ANSI/SPARC reference architecture of Distributed Database System and discuss about the site independent schemas. 6

   b) Show with the help of a diagram that replicated copy of R2 of fragment R1 allocated into different sites as R_1^2 and R_2^1 . 2

   c) When Bottom-up approach of distributed database design preferable over Top-down approach ? 3

   d) Explain advantage of Remote access via an auxiliary program in case of heterogeneous distributed database system with the help of a diagram. 4

8. a) Consider the schema SUPPLIER (SNO, NAME, CITY) and SUPPLY (SNO, PNO, DNO, QUAN) and the following transaction :

```
Read ( tty, $PNO )
Select Name into  $Name
From SUPPLIER, SUPPLY
Where SUPPLIER.SNO=SUPPLY.SNO
AND SUPPLY.PNO=$PNo
Write ( tty,$Name )
```

What is the level of transparency of the above transaction and why ? 3

b) Discuss best-fit approach for a non-replicated allocation of horizontal fragmentation. 5

c) Is any directory file system provides the network transparency ? If yes, explain how the transparency is achieved. 3

d) What is the most complex effect of update operation in distributed database system ? Explain with the help of update subtree. 4

9. Answer any *three* of the following : 3 ∞ 5

a) Difference among multi-database, parallel database and distributed database

b) Federated Database

c) iDM or iMeMx model

d) Serializability in a distributed database

e) OO40.