Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/MCA/SEM-5/MCA-E501A/2009-10

# 2009

# 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 the following : $10 \times 1 = 10$

i) In how many ways $m$ rows and $n$ attributes can be represented ?

a) $m * n$ b) $n! * m$

c) $n * m!$ d) $m! * n!$ .

ii) Granularity means

a) size of memory b) size of data

c) locks d) transaction.

iii) The data dictionary tells the DBMS

a) what files are in the database

b) what attributes are possessed by the data

c) what these files contain

d) all of these.

iv) Clustering means

a) keeping a common data in one place

b) keeping different types of data in different places

c) keeping different types of data in one place

d) keeping in a common data in different places.

v) Spurious tuples may occur due to

i) Bad normalization

ii) Theta joins

iii) Updating tables from join.

a) (i) and (ii)

b) (ii) and (iii)

c) (i) and (iii)

d) (i), (ii) and (iii).

vi) $A, B, C$ is a set of attributes. The functional dependency is as follows :

$AB \rightarrow B, AC \rightarrow C, C \rightarrow B$

a) is in 1NF b) is in 2NF

c) is in 3NF d) is in BCNF.

vii) Which of the following models is used by distributed database system ?

a) Mainframe computing model

b) Disconnected, personal computing model

c) Client/server computing model

d) None of these.

viii) Which of the following refers to the operation of copying and maintaining database object in multiple databases belonging to a distributed system ?

a) Backup b) Recovery

c) Replication d) None of these.

ix) Which of the following is not a benefit of site autonomy ?

a) A global catalog is not necessary to access local data

b) Node can upgrades software independently

c) Administrators can recover from isolated system failures independently

d) No need for backup and recovery.

x) Which of the following is the recovery management technique for distributed system ?

a) Deferred update b) Immediate update

c) Two-phase commit d) None of these.

## GROUP – B

### ( Short Answer Type Questions )

Answer any *three* of the following. $3 \times 5 = 15$

2. Explain different levels of Distributed transparency.

3. a) What is deadlock prevention ?

b) What is the data fragmentation ? Describe the types of data fragmentation. 1 + 1 + 3

4. Write the difference between centralized and distributed DBMS with respect to DBA, redundancy, indexing, reliability and performance.

5. What are fragmentation, replication and location transparencies ?

6. Draw the reference architecture of distributed database.

## GROUP – C

### ( Long Answer Type Questions )

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

7. a) What is transparency ? Discuss network transparency and replication transparency with example. 2 + 6

b) What are the rules of fragmentation ? 2

c) Define derived horizontal fragmentation with an exmaple. 5

8. a) EMP ( ENO, ENAME, TITLE )
ASG ( ENO, PNO, RESP, DUR )
Simplify the following query in SQL, based on the above relations using idempotency rules and give the query graph.
Select ENO
From ASG
Where RESP = " Analyst"
AND NOT ( PNO = " P2" or DUR = 12 ) 7

b) What are the different layers/steps of query processing ? 8

9. a) Describe the two-phase commit protocol with appropriate diagram. What are the demerits of this protocol ? 5 + 2

b) Consider the following :
Select Ename, Resp from Emp, Asg, Proj
where Emp.Eno = Asg.Eno and Pname = " CAD/CAM" and Dur > = 36 and draw its query graph. 8

10. a) Describe the different failures possible in 2-phase commit protocol. What are the outcome of these failures ? 7

b) What is the difference between reliability and availability ? What are the factors affecting the allocation ? What is nested transaction ? 3 + 3 + 2

11. Write short notes on any *three* of the following : 3 × 5

a) Site failure

b) Deadlock handling in DDBMS

c) MDBS

d) Check pointing in Distributed Database

e) Peer-to-Peer Architecture.