Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Sc.(IN.Sc.)/SEM-1/MI-104/2009-10

2009

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

(Objective Type Questions)

1. Answer the following questions : 10 × 1 = 10

i) What is ERD ?

ii) What do you mean by Super key of a relation ?

iii) Define Semi-Structured Data Model.

iv) What is Normalization ?

v) What do you mean by Primary Key Constraint ?

vi) Define DML with an example.

vii) What is the main disadvantage of Hash Addressing Organization technique ?

viii) Define Equi Join.

ix) What is SRA ?

x) What do you mean by Data abstraction ?

GROUP – B

(Short Answer Type Questions)

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

2. What are the different constraints of relational database ?
3. Explain degree and cardinality of relationship with example.
4. Explain granularity of locks. Discuss view serializability.
5. Discuss about optimistic concurrency control and pessimistic concurrency control.
6. "Domain constraints are most elementary form of integrity constraints." Explain with example. Explain how can you restrict values while creating a domain in SQL.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Explain specialization in ER model. 2

   b) Construct an ER diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. 10

   c) Explain simple attribute, composite attribute and multivalued attribute. 3

8. a) Explain various set operations in relational algebra. 6

   b) Define left and right outer join with proper example. 5

   c) What are the characteristics of a relation ? 4

9. a) Define conflict serializability with example. What is cascading rollback ? In 2 phase locking how can starvation be avoided ? Will 2 phase locking results serializable schedule ? 3 + 3 + 3 + 3

b) A relation R has attributes A, B, C, D; A set of functional dependencies F = { A – > B, A – > C, C – > D } holds on this relation. This relation R has been decomposed into R1 (A, B, C) and a set of functional dependencies on R1 is F1 = { A – > B, A – > C } and R2 (C, D) and a set of functional dependencies on R2 is F2 = { C – > D }.

Prove that the decomposition is dependency preserving. 3

10. a) Create the tables with following structure : 3 + 2

i) EMP table :

EMPNO NUMERIC 5, MANAGER CHARACTER 20, DNO NUMERIC 2, SALARY NUMERIC 7, AGE NUMERIC 2.

ii) DEPT table :

DNO NUMERIC 2, DNAME CHARACTER 20, FLOOR NUMERIC 1.

EMP :

EMPNO	EMPNAME	MANAGER	DNO	SALARY	AGE
1	Bob	Joe	1	5000	19
2	Tade	Joe	1	6500	21
3	Sally	Ron	2	11000	34
4	May	Joe	1	7000	27
5	Joe	Ron	2	15000	40
6	Ron	Jeremy	3	20000	55

DEPT :

DNO	DNAME	FLOOR
1	SALES	2
2	MANUFACTURE	1
3	ADMINISTRATION	3

b) Write down the following queries in SQL : 10 × 1

i) Find out age and salary of both Tade and Sally.

ii) Find out employee names that are at least 4 characters long.

iii) If 60 is the retirement age then find out how many years of service each of the employees still has.

iv) Whatis the total yearly salary paid to all employees ?

v) Select all the employee names whose manager's works in Manufacture Department.

vi) Select all employees who work in same Department as Joe.

vii) Select the eldest person working under each manager.

viii) Update salary of those employees who works in floor 2 by increasing their salary by 500.

ix) Create a view to represent which employee works on which floor.

x) Grant update privilege to user 'jim' on SALARY column of EMP table.

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

a) First normal form normal

b) Normalization *vs* performance

c) Decomposition

d) BCNF

e) 3NF

f) 4NF.