Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/BCA/SEM-4/BCA-401/2010

2010

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) Association among several entities is known as

      a) attribute b) relationship

      c) field d) none of these.

   ii) In ER model ◯ symbol is used for

      a) attribute b) entity

      c) relation d) none of these.

   iii) Relational algebra is a

      a) procedural language

      b) non-procedural language

      c) object oriented language

      d) all of these.

iv) SQL stands for
   a) Select Query Language
   b) Structured Query Language
   c) Both (a) & (b)
   d) None of these.

v) BCNF is a type of
   a) Indexing b) DFD
   c) Normalization d) None of these.

vi) Which of the following is *not* one of the four categories described in the data dictionary ?
   a) Data structure b) Data store
   c) Process d) Data flow.

vii) An index on the search key is called á
   a) primary index b) secondary index
   c) multi-level index d) all of these.

viii) A person who has central control over the system is called a
   a) data analyst
   b) data selector
   c) database administrator
   d) none of these.

ix) Any relation that is not part of the logical model, but is made visible to a user as a virtual relation, is called as
   a) relation b) view
   c) tuple d) none of these.

x) In relation algebra $\prod$ symbol is used for
   a) selection b) union
   c) intersection d) projection.

GROUP – B
(Short Answer Type Questions)

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

2. Explain hierarchical data model with suitable examples.

3. State the properties of relational model.

4. Describe the three-level architecture of DBMS.

5. "All primary keys are the super key but the converse is not true." Clarify. Define candidate key and alternate key with example.

6. Describe briefly the role of DBA in the base design. What is the data dictionary. 2 + 3

GROUP – C
(Long Answer Type Questions)

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

7. a) What is multiple relationship ?

   b) What is attribute inheritance ?

   c) With an example, describe specialization and generalization.

   d) Draw ER diagram showing the cardinality for the following problem :

      i) A bill is sent to a customer. A customer may receive many bills.

      ii) A clerk works in a blank. The bank has many clerks

      iii) Students appears for seats in colleges. Each student can get almost one seat. A college has many seats. A student can sent many applications. 2 + 2 + 4 + 2 + 2 + 3

8. a) State Armstrong's axioms.

   b) What is functional dependency ? Explain with example.

   c) Explain the difference between external, internal and conceptual schemas. 5 + 5 + 5

9. a) Distinguish between logical and physical data dependency.

   b) Explain the database languages with SQL command.

   c) Define 2nd NF, 3rd NF and BCNF with example.

   4 + 4 + 7

10. Consider the following two schemas :

    EMP (EMP#, ENAME, JOB, HIREDATE, MANAGER#, SALARY, COMM, DEPT#)

    DEPT (DEPT#, DNAME, LOCATION)

    Perform the following queries on the tables (write appropriate SQL statement) :

    i) List the name, salary and PF amounts of all employees (PF is calculated as 10% of the basic)

    ii) List the number of employees and average salary in DEPT# 20

    iii) List the department number and total salary payable in each department

    iv) List the names of the employees who are more than twenty years old in the company

    v) List the names of the employees whose name either starts or ends with *S*.

    3 + 3 + 3 + 3 + 3

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

    a) Data dictionary

    b) Data abstraction

    c) Query optimization technique

    d) ACID property

    e) Functional dependency.