Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/BCA/SEM-4/BCA-401/2011

2011
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 × 1 = 10

    i)   Updating a database means

        a)   revisiting the file structure

        b)   revisiting the database structure or schema

        c)   changing one or more database

        d)   normalization of database.

    ii) To select a tuple from a relational database, the symbol used in relational algebra is

        a)   Pie

        b)   Lamada

        c)   Sigma

        d)   Gama.

iii) What tuple relational calculus does it to

    a) Select entire table

    b) Select domain variable

    c) Select database schema

    d) Select tuple variables.

iv) The operation of a certain relation X, produces Y such that Y contains only selected attributes of X. Such an operation is

    a) Projection   b) Selection

    c) Union   d) Difference.

v) Which index is specified on the non-ordering fields of a file ?

    a) Primary   b) Clustering

    c) Secondary   d) None of these.

vi) One approach for standardizing data storage is

    a) MIS

    b) CODASYL specification

    c) structured programming

    d) data storage can not be standardized.

vii) .... is not a relational database.

   a) Oracle   b) RDBMS

   c) YGL   d) DBMS IV.

viii) A database management system

   a) allow simultaneous access to multiple files

   b) allow simultaneous access to multiple records of database

   c) both (a) and (b)

   d) none of these.

ix) Which is the SQL command to remove row from a table ?

   a) REMOVE

   b) DELETE

   c) TRUNCATE

   d) All of these.

x) Which of the SQL command to change a data in table ?

   a) UPDATE

   b) INSERT

   c) BROWSE

   d) APPEND.

GROUP – B
(Short Answer Type Questions)

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

2. What do you mean by DBMS ? How many types of DBMS are there ? $2 + 3$

3. What are the differences between Traditional File Management System and Database Management System ? $3 + (1 + 1)$

4. What do you mean by Data Dependency ? What do you mean by redundant data ? $2 + 3$

5. Indicate disadvantages of DBNS. Write down the application of DBNS. $2 + 3$

6. What are the functions of a Database Administrator ? 5

7. What is information ? How does it differ from data ? $2 + 3$

GROUP – C
(Long Answer Type Questions)

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

8. a) Let R = (A, B, C) and let r1 and r2 both be relation on schema R. Give an expression in SQL that is equivalent to each of the following queries :

   i) $r_1 \cup r_2$

   ii) $r_1 \cap r_2$

   iii) $r_1 - r_2$

   vi) $\Pi_{AB}(r1) \times \Pi_{Bc}(r2)$.

   b) Describe Record based data model.

   c) What do you mean by strong and weak entities ? $8 + 5 + 2$

9. a) What do you mean by integrity constraint ? Describe.

b) What is lossless decomposition ?

c) What do you mean by closure ?

d) Suppose that we decompose the schema, R = (A, B, C, D, E) into (A, B, C) and (A, D, E). Show that this decomposition is loss less decomposition, if the following set F of FDs holds-

A → BC

CD → E

B → D

E → A   3 + 3 + 3 + 6

10. a) Compute the closure of the set F of FDs for the relation schema, R = (A, B, C, D, E)

A → BC

CD → E

B → D

E → A.

List the candidate keys for R.

b) What do you mean by Super key, Candidate key and Primary key ?

c) Describe any *two* limitations of file system.   7 + 3 + 5

11. a) What is data anomaly ? Define functional dependency. Describe Armstrong's axioms. Describe minimal set of FDs.

b) Consider the universal relation

$R = \{ A, B, C, D, E, F, G, H, I, J \}$ and the set of functional dependencies are

$F = \{ \{ A, B \} -> \{ C \}, \{ A \} -> \{ D, E \}, \{ B \} -> \{ F \},$
$\{ F \} -> \{ G, H \}, \{ D \} -> \{ I, J \} \}.$

This set represents which normal form ?

$2 + 2 + 3 + 3 + 5$

12. What is the difference between primary index and secondary index ? What is hashing ? Explain dynamic hashing.

Draw the ERD :

Consider a hospital :

Patients are treated in a single ward by the doctors assigned to them. Usually each patient will be assigned a single doctor, but in rare cases they will have two.

Healthcare assistants also attend to the patients; a number of these are associated with each ward. Initially the system will be concerned solely with drug treatment. Each patient is required to take a variety of drugs a certain number of times per day and for varying lengths of time.
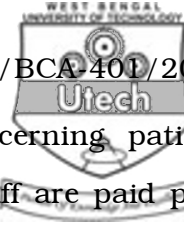
The system must record details concerning patient treatment and staff payment. Some staff are paid part time and doctors and card assistants work varying amounts of overtime at varying rates (subject to grade).

The system will also need to track what treatments are required for which patients and when and it should be capable of calculating the cost of treatment per week for each patient (though it is currently unclear to what use this information will be put).   4 + 2 + 4 + 5

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

    a)   Normalization

    b)   Query Optimization Technique

    c)   Codds rule

    d)   Selection and Projection

    e)   Inner join and Outer join.