ROLL NO. _____

DipIETE – CS (NEW SCHEME) – Code: DC62

Subject: DATABASE MANAGEMENT SYSTEMS

Time: 3 Hours **Max. Marks: 100**

DECEMBER 2011

NOTE: There are 9 Questions in all.

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Temporary table given along with a table name in FROM clause is called _____

(A) Sub Query **(B)** Natural Join
(C) Table Alias **(D)** None of the above

b. The Join in which table are compared for equality is called_____.

(A) Equi Join **(B)** Self Join
(C) Outer Join **(D)** None of the above

c. Basic unit of storage in RDBMS is_____.

(A) Index **(B)** Query
(C) Table **(D)** None of the above

d. Which of the following symbol is used to represent all the columns in a table?

(A) # **(B)** *
(C) % **(D)** @

e. A query that combines Rows from two or more tables is called_____.

(A) Union **(B)** Join
(C) Query **(D)** None of the above

f. A_____ is a unique series of number that can be used to generate Primary Key.

(A) Sequence **(B)** Index
(C) View **(D)** Synonym

g. Which of the following is used to evaluate a query execution strategy?

(A) Query tree **(B)** Access plan
(C) Database catalog **(D)** None of the above

h. What is the alternate name for a database table?

(A) Synonym **(B)** Index
(C) Virtual **(D)** None of the above

i. _____ are the files that keep track of location of each row or group of rows in a table.

(A) View **(B)** Object
(C) Indexes **(D)** Synonym

j. What is the degree of a table with 1000 rows and 10 columns?

(A) 10 **(B)** 100
(C) 1000 **(D)** None of the above

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Explain the advantages of DBMS. **(8)**

b. Explain the three-schema architecture with the help of diagram. **(8)**

Q.3 Explain the following with suitable example:- **(16)**

(i) Primary Key (ii) Update command
(iii) Alternate Key (iv) Foreign key
(v) Referential Integrity (vi) Candidate key
(vii) Super key (viii) Insert command

Q.4 What is meant by unary and binary relational operations? Define the following operations giving their symbol for representation and an appropriate example. Also categorise these as binary or unary
(i) Select (ii) Project
(iii) Join (iv) Division **(16)**

Q.5 Consider the COMPANY database as following:

EMPLOYEE(Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno)
DEPARTMENT(Dname, Dnumber, Mgr_ssn, Mgr_start_date)
DEPT_LOCATIONS(Dnumber, Dlocation)
PROJECT(Pname, Pnumber, Plocation, Dnum)
WORKS_ON(Essn, Pno, Hours)
DEPENDENT(Essn, Dept_name, Sex, Bdate, Relationship)

Write SQL queries for the following:

(i) Retrieve the birth date and address of the employee whose name is "John B. Smith".

(ii) Retrieve the name and address of all employees who work for the "Research" department.

(iii) Retrieve the names of all employees who do not have supervisors.

(iv) Retrieve the salary of every employee. **(4×4=16)**

Q.6 a. Define canonical cover F_c for a set F of functional dependencies. Consider the following set F of functional dependencies on schema (A, B, C):

$A \rightarrow BC$

$B \rightarrow C$

$A \rightarrow B$

$AB \rightarrow C$

Compute the canonical cover for F. **(8)**

b. Define Armstrong's axioms. Why are these called sound and complete? **(8)**

Q.7 a. What are the difference between Functional, Multivalued and Join Dependencies? Give examples. **(8)**

b. What is normalization? Explain Boyce-Codd normal form with the help of a suitable example? **(4)**

c. How 4NF differs from BCNF? Is every 4NF schema in BCNF? **(4)**

Q.8 a. How hash file organisation is better than indexed file organisation? Justify your answer with an example. **(6)**

b. Explain B-trees concept used in file organisation. **(4)**

c. What do you mean by indexing? What are the different types of indexing? **(6)**

Q.9 a. What do you mean by External Sorting? Explain external sort-merge algorithms. Use a suitable example to demonstrate. **(8)**

b. How an expression containing multiple operations is evaluated? Discuss both materialization and pipelining approach. **(8)**