ROLL NO. _____

Code: DC62 Subject: DATABASE MANAGEMENT SYSTEMS

DipIETE – CS (NEW SCHEME)

Time: 3 Hours **JUNE 2012** **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **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. Duplicate data often results in loss of data integrity because:

(A) the data formats may be inconsistent
(B) data values may not agree
(C) Both **(A)** & **(B)**
(D) Neither **(A)** nor **(B)**

b. Which of the following types of databases are the most common?

(A) Personal **(B)** Workgroup
(C) Department **(D)** Enterprise

c. The fastest read/write time and most efficient data storage of any disk array type is:

(A) RAID-0 **(B)** RAID-1
(C) RAID-2 **(D)** RAID-3

d. The three-schema components does not include

(A) internal schema **(B)** conceptual schema
(C) programming schema **(D)** external schema

e. An entity name should be

(A) A singular noun **(B)** Specific to the organization
(C) Concise **(D)** All of the above

f. An attribute name should be

(A) Singular verb or verb phrase **(B)** Follow a standard format
(C) Use a alias **(D)** All of the above

g. A subtype entity name should be

(A) A singular noun **(B)** Specific to the organization
(C) Concise **(D)** All of the above

h. Inheritance is

(A) When a supertype entity inherits values of the subtype attribute
(B) When a subtype entity inherits values of the supertype attribute
(C) When a supertype entity inherits values of another supertype attribute
(D) When a subtype entity inherits values of another subtype attribute

i. Selecting a data type involves

(A) Maximize storage space **(B)** Represent most values
(C) Improve data integrity **(D)** All of the above

j. If a demoralization situation exists with a one-to-one binary relationship, which of the following is true?

(A) All fields are stored in one relation
(B) All fields are stored in two relations
(C) All fields are stored in three relations
(D) All fields are stored in four relations

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

Q.2 a. What are the responsibilities of DBA and the database designers? **(8)**

b. What is the difference between logical data independence and physical data independence? **(4)**

c. What is the difference between two-tier and three-tier architecture for RDBMS? **(4)**

Q.3 a. Explain the difference between stored and derived attribute. **(4)**

b. Why are Tuple in a relation not ordered? **(4)**

c. What are the enhancements that distinguish the EER Model from ER model? **(8)**

Q.4 a. List the operation of relational algebra and the purpose of each. **(8)**

b. Describe the correspondence between ER model constructs and relational model constructs with the help of an example. **(8)**

Q.5 Write SQL statements:

(i) Create tables Department, Employee, Project (user may assume structure of the table) **(4)**
(ii) Write a query to RETRIEVE A LIST OF EMPLOYEES AND THE PROJECTS THEY ARE WORKING ON,ORDERED BY DEPARTMENT AND, WITHIN EACH DEPARTMENT ,ORDERED ALPHABETICALLY BY LAST NAME **(4)**
(iii) Discuss insert a tuple in Employee table statement. **(4)**
(iv) Delete Project table. **(4)**

Q.6 a. What are insertion deletion and modification anomalies? Why are they considered bad? Illustrate with examples. **(6)**

b. What is a minimal set of functional dependencies? **(4)**

c. How does SQL implement the entity integrity and referential integrity constraints of the relational data model? Explain with an example. **(6)**

Q.7 a. Define 4^{th} normal form & lossless join decomposition. **(8)**

b. Explain BOYCE-CODD normal form. **(8)**

Q.8 a. What is the difference between primary and secondary storage? **(8)**

b. Describe internal hashing with suitable algorithm. **(8)**

Q.9 a. What are the reasons for converting SQL queries into relational algebra queries before optimization is done? **(8)**

b. What is meant by semantic query optimization? How does it differ from other query optimization techniques? **(8)**