ROLL NO. _____

Code: DC62 Subject: DATABASE MANAGEMENT SYSTEMS

DipIETE – CS (Current Scheme)

Time: 3 Hours **DECEMBER 2018** **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. For a table to be in third normal form, it must necessarily be in:
(A) 1 AND 2 NF **(B)** 2NF
(C) 1NF **(D)** BCNF

b. The rule that a value of a foreign key must appear as a value of some specific table is called a/an
(A) Integrity constraint **(B)** Index
(C) Referential constraint **(D)** Functional dependency

c. The main task of which normal form is to remove repeating attributes to separate tables.
(A) First Normal Form **(B)** Fourth Normal Form
(C) Third Normal Form **(D)** Second Normal Form

d. Which of the following is the activity of the coordinating processes that operate in parallel and access shared data?
(A) Transaction management **(B)** Concurrency control
(C) Security management **(D)** Recovery management

e. Which one is the lowest level of data model?
(A) external data model **(B)** logical data model
(C) physical data model **(D)** None of these

f. The statement in SQL which allows to change the definition of a table is
(A) Select **(B)** Update
(C) Create **(D)** Alter

g. One solution to the multivalued dependency constraint problem is to:
(A) change the theme
(B) split the relation into two relations, each with a single theme
(C) create a new theme
(D) add a composite key

h. Which of the following is an advantage of the database approach?
(A) Elimination of data redundancy **(B)** Ability of associate deletion data
(C) Increased security **(D)** All of these

i. An entity name should be
(A) A singular noun **(B)** Specific to the organization
(C) Concise **(D)** All of these

j. A _____ is a unique series of number that can be used to generate Primary Key.
(A) Sequence **(B)** Index
(C) View **(D)** Synonym

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

Q.2 a. What is a database? Describe the advantages and disadvantages of using DBMS over file system. **(8)**

b. Explain the differences between conceptual & external schema. **(4)**

c. What are the characteristics of database? **(4)**

Q.3 a. What is the significance of ER diagram? **(4)**

b. Explain the following with the help of suitable example. **(3×4)**
(i) Primary Key (ii) Insert command
(iii) Alternate Key (iv) Foreign Key

Q.4 a. Explain basic operators of relational algebra. **(8)**

b. Explain relational database design using ER-to-Relational Mapping. **(8)**

Q.5 a. Explain any 10 basic SQL queries. **(8)**

b. List the three main approaches for database programming? What are the advantages and disadvantages of each approach? **(8)**

Q.6 An invoice management system stores the invoice details as follows:

Invoice No.	Invoice date	Order no	Challan no	Cust no	Cust name	Item no	Item desc.	QTY sold	rate	Discount	Invoice value
112	12/8/2014	1	1	C1	SRIKANT	I1	PEPSI	2	25	NIL	75
112	12/8/2014	2	1	C1	SRIKANT	I2	BUTTER	1	60	NIL	75
113	16/8/2014	1	1	C4	KAVITA	I4	BREAD	1	22	NIL	22
114	16/8/2014	1	1	C1	SRIKANT	I8	BISCUIT	2	60	NIL	92
114	16/8/2014	2	1	C1	SRIKANT	I2	PEPSI	4	25	NIL	92

Apply normalization until you cannot decompose the invoice relational table further. State reasons behind each decomposition. **(16)**

Q.7 a. Differentiate among the following: **(8)**
(i) Theta Join (ii) Equi Join
(iii) Natural Join (iv) Outer Join

b. Explain dependency preserving decomposition into 3NF scheme. **(8)**

Q.8 a. Discuss the single-level ordered indexes and their types. **(8)**

b. Explain Index on multiple keys. **(8)**

Q.9 a. How to translate SQL queries into relational algebra? **(8)**

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