ROLL NO. _____

Code: DC112 **Subject: DATABASE MANAGEMENT SYSTEMS**

DipIETE – CS (New Scheme)

Time: 3 Hours **June 2019** **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)

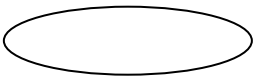
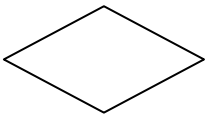
a. Set of permitted values of each attribute is called

(A) Domain **(B)** Relation
(C) Schema **(D)** Tuple

b. Which of the following term is used to refer a raw?

(A) Instance **(B)** Tuple
(C) Attribute **(D)** Field

c. Which of the following symbols represent relationship sets in an ER diagram

(A)  **(B)** 

(C)  **(D)** 

d. Which of the following is Unary operation?

(A) Join **(B)** Minus
(C) Union **(D)** Project

e. _____is schema change statement in SQL.

(A) ALTER **(B)** DELETE
(C) SELECT **(D)** TRUNCATE

f. If every non-key attribute is functionally dependent on the primary key, then the relation is in

(A) 1NF **(B)** 2NF
(C) 3NF **(D)** BCNF

g. Any entity in A is associated with any number of entities in B, however an entity in B is associated with almost one entity in A

(A) One to many **(B)** Many to one
(C) Many to many **(D)** One to one

h. Key represents relationship between tables is called.

(A) Primary key **(B)** Unique key
(C) Secondary key **(D)** Foreign key

i. Which of the following makes the transaction permanent in the database?

(A) View **(B)** Rollback
(C) Commit **(D)** Savepoint

j. The separation of the data definition from the program is known as

(A) Data dictionary **(B)** Data integrity
(C) Referential integrity **(D)** Data independence

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

Q.2 a. List responsibilities of the DBA. **(4)**

b. Explain the concept of data independence. **(4)**

c. Draw and explain three-schema architecture of DMBS. **(8)**

Q.3 a. Explain specialization with example. **(4)**

b. Explain following terms: composite attribute, multivalued attribute and cardinality ratio. **(6)**

c. Draw ER diagram for a company database. **(6)**

Q.4 a. Consider the following relations for a database that keeps track of business trips of salespersons in a sales office. **(4)**
SALESPERSON (SSN, Name, Start_Year, Dept_No)
TRIP (SSN, From_City, To_City, Departure_Date, Return_Date, Trip_ID)
EXPENSE (Trip_ID, Account#, Amount)
Specify the foreign keys for this schema, stating any assumptions you make.

b. List and explain different domain constraints. **(6)**

c. Discuss constraint violations using example. **(6)**

Q.5 a. Explain Select Operation (σ), Project Operation (π) with example. **(6)**

b. What is complete set of relational algebra operations? **(6)**

c. Consider the following relational Schema and give the write following queries in relational algebra: **(1+1+2)**
Suppliers(sid, sname, city, street)
Parts(pid, pname, color)
Catalog(sid, pid, cost)

i. Name of suppliersfrom “Delhi”.
ii. Name of parts each has costless than 2500.
iii. Find all available parts in city “Bangalore”

Q.6 a. Write an SQL statement to create a table named EMPLOYEE including columns EMP_ID, FIRST_NAME, LAST_NAME, EMAIL, PHONE_NUMBER , SALARY, and DESIGNATION.Set EMP_ID as primary key and make sure that no designation except ‘manager’, ‘clerk’, and ‘salesman’ will be entered in the table. **(6)**

b. Discuss insert, update and delete statement in SQL. **(6)**

c. Explain any two aggregate functions in SQL. **(4)**

Q.7 a. What is Functional Dependency? Explain how to find minimal cover of a set of functional dependencies. **(8)**

b. Give general definition of second and third normal form. **(4)**

c. Explain boyce-codd normal form. **(4)**

Q.8 a. Explain the lossless join property of decomposition. **(4)**

b. Discuss the null value and dangling tuple problems **(4)**

c. What is a multivalued dependency? Explain fourth normal form. **(8)**

Q.9 a. What is serializability? Explain view equivalence of schedules. **(8)**

b. Discuss desirable propertiesof a database transaction. **(8)**