Code: DC62   **Subject: DATABASE MANAGEMENT SYSTEMS**

DiplETE – CS (Current Scheme)

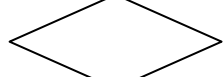**Time: 3 Hours**   **June 2019**   **Max. Marks: 100**

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.   _____ is responsible for authorizing access to the database, for coordinating and monitoring its use, and for acquiring software and hardware resources as needed.
   (A)   Database administrator   **(B)**   Application programmer
   (C)   Database designer   **(D)**   System analysts

b.   The capacity to change the conceptual schema without having to change external schemas is known as
   (A)   Internal schema   **(B)**   Physical data independence
   (C)   Logical data independence   **(D)**   External schema

c.   Ability to modify schema of database in one level without affecting the schema definition in higher level is called as
   (A)   Data isolation   **(B)**   Data migration
   (C)   Data independence   **(D)**   Data abstraction

d.   Derived attributes in entity relationship diagrams are denoted by

   (A)   **(B)**

   (C)   **(D)**

e.   _____removes all rows from a table without deleting the table.
   (A)   DELETE   **(B)**   REMOVE
   (C)   DROP   **(D)**   TRUNCATE

f. Which of the normal form is based on multivalued dependencies?
    (A) First   **(B)** Second
    (C) Third   **(D)** Fourth

g. A file is organized so that the ordering of data records is the same as the ordering of data entries in some index. Then that index is called
    (A) Dense   **(B)** Clustered
    (C) Sparse   **(D)** Unclustered

h. A table can have only one
    (A) Primary key   **(B)** Composite key
    (C) Candidate key   **(D)** Foreign key

i. Which level of RAID refers to block-level striping with interleaved parity.
    (A) RAID Level 2   **(B)** RAID Level 3
    (C) RAID Level 4   **(D)** RAID Level 5

j. Which of the following can be a multivalued attribute?
    (A) Phone_number   **(B)** Name
    (C) Date _of_birth   **(D)** All of these

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

Q.2   a.   Discuss advantages of using the DBMS Approach.   **(8)**

         b.   Explain Three-schema architecture of DBMS.   **(4)**

         c.   Draw logical Three tires Client/server Architecture.   **(4)**

Q.3   a.   Define following terms: entity, composite attributes, multivalued attributes, domain.   **(4)**

         b.   Design ER diagram for the company system.   **(6)**

         c.   Discuss update operations dealing with constraint violations.   **(6)**

Q.4   a.   Consider the following relational Schema and write the following queries in relational algebra: **(6)**
            Student(Student_id, Student_Name, City)
            Course(Course_id, Course_Name, Course_fees)
            EnrolledIn(Student_id, Course_id)
            a) Name of Students lives in city "Delhi".
            b) Name of Course with more than 3,000 course fees.
            c) Name of Students who are enrolled in course "TallyERP".

b.   Write steps for ER-to-Relational Mapping.   **(4)**

c.   Explain Select Operation (σ), Project Operation (π) with example.   **(6)**

Q.5 a.   Write syntax for ALTER and INSERT statement in SQL.   **(4)**

b.   Consider the BOOK table and write query for: **(6)**
i)   Get all book details from BOOK table.
ii)   List all book details with publisher 'Tech'.
iii)   List name of all authors who published more than two books.

Title	ISBN	Cost	AuthorName	PublisherName
Swimming	13564	29.5	Devid	Tech
Economics	33534	651.0	Meena	Universal
Database	88585	224.50	Rakesh	Tech
Operating system	22036	110.50	Sunil	Universal
Health tips	45566	54.50	Devid	AdityaPub

c.   Explain the GROUP BY and HAVING clauses.   **(6)**

Q.6 a.   What is functional dependency? Write steps to find minimal cover of a set of functional dependencies.   **(8)**

b.   Explain second normal form with suitable example.   **(8)**

Q.7 a.   Explain lossless join property of decomposition.   **(4)**

b.   Explain boyce-codd normal form in brief.   **(4)**

c.   Explain multivalued dependencies and fourth normal form with suitable example.   **(8)**

Q.8 a.   Write short note on RAID technology.   **(4)**

b.   Define following terms: cylinder, sector, read/write head.   **(6)**

c.   Construct B tree to insert the following numbers (minimum degree of the tree is 3) 10, 20, 30, 40, 50, 60, 70, 80 and 90   **(6)**

Q.9 a.   Discuss the converting SQL queries into relational algebra queries.   **(8)**

b.   What does heuristic optimization mean? Discuss heuristic optimization of query trees.   **(8)**