Code: 17F00301

MCA III Semester Supplementary Examinations May 2019
DATABASE MANAGEMENT SYSTEMS
(For 2017 admitted batches only)

Time: 3 hours   Max. Marks: 60

Answer all the questions
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1 (a) With help of a neat block diagram, explain the basic architecture of a database management system.
   (b) What are the functions of database administrator?

OR

2 (a) Construct an ER diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars, and has one or more premium payments associated with it. Each payment is for a particular period of time, and has as associated due date, and the date when the payments was received.
   (b) Discuss the correspondence between the ER model construct and the relational model constructs.

3 (a) Explain selection, projection and Cartesian product operations in relational algebra with example.
   (b) Exemplify the ideas of Domain Relational Calculus with different kind of examples.

OR

4   Assume the following table:
        Degree (degcode, name, subject)
        Candidate (seatno, degcode, name, semester, month, year, result)
        Marks(seatno, degcode, semester, month, year, papcode, marks)
        Degcode-degree code, name- name of the degree (MSc, MCom)
        subject- subject of the course (eg.Physics), papcode- paper code (eg.A1)
        Solve the following queries using SQL.
        (i) Write a SELECT statement to display all the degree codes which are there in the candidate table but not present in degree table in the order of degcode.
        (ii) Write a SELECT statement to display the names of all the candidates who have got less than 40 marks in exactly 2 subjects.
        (iii) Write a SELECT statement to display the names of all the candidates who have got highest total marks in MSc (Maths).

5   Define a functional dependency. List and discuss any three inference rules for functional dependencies. Give relevant examples.

OR

6 (a) Consider a relation R that has three attribute ABC. It is decomposed into relations R_1 with attributes AB and R_2 with attributes BC. State the definition of lossless-join decomposition with respect to this example. Answer this question concisely by writing a relational algebra equation involving R, R_1 and R_2.
   (b) Describe about the multi-valued dependencies with suitable examples.

7 (a) Draw transaction state diagram and describe each state that a transaction goes through during its execution.

   (b) What is 2-phase locking protocol? How does it guarantee serializability?

OR

8 (a) How does the system recovers from failure? Exemplify the steps involved in a recovery process with neat sketch?

   (b) Write short notes on buffer management

9   Define a B+ tree. Construct B+ tree to insert the following numbers (order of the tree is 3) 3, 2, 5, 7, 6, 23, 24, 35, 67, 44, 43, 42, 17, 18, 19. Show the tree at each insertion.

OR

10 (a) What are Clustering Indexes? Discuss with example.

   (b) Compare extendible hashing and linear hashing with suitable examples.

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