Roll No ....

MCADD-603

M.C.A. (Dual Degree/Integrated Course), VI Semester

Examination, May 2018

Advanced DBMS

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Discuss, briefly, the features of different data models.

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b) A university registrar's office maintains data about the following entities:

(i) courses, including number, title, credits, syllabus, and prerequisites;

(ii) course offerings, including course number, year, semester, section number, instructor(s), timings and classroom;

(iii) students, including student-id, name and program; and

(iv) instructors, including identification number, name department and title.

Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled. Construct an E-R diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.   7

2. a) What benefit does strict two-phase locking and rigorous two phase locking provide? Discuss if they provide any disadvantages. 7

   b) Discuss specialization, generalization and aggregation with appropriate example. 7

3. a) Describe the various Join operations with suitable symbols. Give one example for each. 7

   b) Write short notes on primary index and secondary index with suitable examples. 7

4. a) Explain the different types of entity constraints with examples. 7

   b) Consider the following relational schema: 7

   Emp (SSN, Name, MGR_SSN, Salary, Dno)

   Dept (Dno, Dname, Mgrssn)

   Write the following of queries in SQL.

   i) Display the names of the employees in the descending order of their salaries.

   ii) Retrieve the names of the employees working in 'IT' department.

   iii) Retrieve the department number (DNo), number of employees in each department and average salary of each department.

   iv) Retrieve the names of employees who have no supervisors.

5. a) What are the main difference between designing a relational database and an object database? 7

   b) Give a relation R = {A, B, C, D, E, H}, having a set of functional dependencies

      F={A->BC, CD->E, E->C, D->AEH, ABH->BD, DH->BC}

      Find the key for relation R with respect to F. 7

6. a) Consider the universal relation R={A,B,C,D,E,F,G,H,I,J} and the set of functional dependencies F={ AB→C, A→DE, B→F, F→GH, D→IJ }. Assume no multivalues are present.

      i) What is the key for R?

      ii) Decompose R into 2 NF and then into 3 NF relations. 7

   b) Explain the various types of log based recovery techniques. 7

7. a) How does Timestamp Ordering protocol work? Explain with an example. 7

   b) Elaborate on Vertical and horizontal fragmentation of a database in a distributed environment. 7

8. a) Describe multimedia database and what are the different types of multimedia data that are available in current systems. 7

b) What are the advantages of RAID? Discuss in detail the following RAID Levels.   7

  i)   RAID 0

  ii) RAID 1

  iii) RAID 2

  iv) RAID 5

  v)   RAID 10

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