Reg. No.									

MANIPAL UNIVERSITY

FIRST SEMESTER ME (EMBEDDED SYSTEMS & INSTRUMENTATION) (ESIGELEC, FRANCE) DEGREE EXAMINATION – NOVEMBER 2015

SUBJECT: ESI 617.1 (ELECTIVE 2) – DATABASE MANAGEMENT SYSTEMS

Friday, November 20, 2015

Time: 10:00 – 13:00 Hrs.   Max. Marks: 100

1. What is the primary goal of DBMS? Explain four different types of database users and differentiate the way to interact with the system.

    (2+8 = 10 marks)

2. Draw ER diagram for Teacher Evaluation service for college students.

    To keep track of each student's id, name, major and year. Assume all ids are unique. To track of each teacher's name (assume names are unique), department, and status. To keep track of all sections that each teacher has ever taught. To keep track of the course name, the section number, and the semester. All teachers have taught at least one section, and each section is taught by a single teacher. But in any given semester, we may have many sections of the same course, taught by different teachers. A teacher may never have been rated, but may have been rated by many students. A student must have made at least one rating of a particular teacher teaching a particular section. Each rating includes the date of the rating and a number on a scale from 1 to 10. A student may rate a teacher many times, but only once for each section that teacher has taught.

    (10 marks)

3. Explain the steps involved in Mapping Associative entity and recursive relation from ER model into relational model with an example.

    (10 marks)

4. Which of the following plays important role in representing information about the real world in a database. Explain Briefly.
4A. Data Definition Language
4B. Data Manipulation Language
4C. Data Model

    (2½+2½+5 = 10 marks)

5. Discuss the following in relation algebra
5A. Deletion
5B. Insertion
5C. Updating
5D. Assignment

    (2½ marks × 4 = 10 marks)

6. Consider the following relations:
    Student(snum: integer, sname: string, major: string, level: string, age: integer)
    Class(name: string, meets at: string, room: string, fid: integer)
    Enrolled(snum: integer, cname: string)
    Faculty(fid: integer, fname: string, deptid: integer)

Write the following queries in SQL:

6A. For each faculty member that has taught classes only in room R128, print the faculty member's name and the total number of classes she or he has taught.

6B. Find the names of students enrolled in the maximum number of classes.

6C. Find the names of students not enrolled in any class.

6D. For each age value that appears in Students, find the level value that appears most often. For example, if there are more FR level students aged 18 than SR, JR, or SO students aged 18, you should print the pair (18, FR).

(2½ marks × 4 = 10 marks)

7.   Briefly Discuss in SQL

7A. Integrity constraints in Create Table

7B. Drop and Alter Table constructs

(5 marks × 2 = 10 marks)

8.   Discuss five aggregation operations in SQL with an example.

(10 marks)

9.   Define Sub queries. List out the advantage and drawbacks of using sub queries. Explain sub-queries using EXISTS and IN.

(10 marks)

10. A software contract and consultancy firm maintains details of all the various projects in which its employees are currently involved. These details comprise:
   •   Employee Number
   •   Employee Name
   •   Date of Birth
   •   Department Code
   •   Department Name
   •   Project Code
   •   Project Description
   •   Project Supervisor

Assume the following:
   •   Each employee number is unique.
   •   Each department has a single department code.
   •   Each project has a single code and supervisor.
   •   Each employee may work on one or more projects.
   •   Employee names need not necessarily be unique.
   •   Project Code, Project Description and Project Supervisor are repeating fields.

Normalise this data to Third Normal Form.

(10 marks)

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