Question Paper

MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES
FIRST SEMESTER MASTER OF SCIENCE- M.Sc. (INFORMATION SCIENCE)
DEGREE EXAMINATION - NOVEMBER 2017
DATE : Monday, November 20, 2017
TIME : 10:00AM - 1:00PM

Database Management Systems [MIS 503]

Marks: 100 **Duration: 180 mins.**

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Answer all the questions.

All questions carry equal marks

1) Discuss difference between DBMS and conventional file processing system. (10)

2) Discuss briefly DDL, DSDL, DML and 'Procedural & Nonprocedural' languages (10)

3) Consider the following information about a university database: (10)

Professors have an SSN, a name, an age, a rank, and a research specialty. Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget. Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S.or Ph.D.).Each project is managed by one professor (known as the project's principal investigator).Each project is worked on by one or more professors (known as the project's co-investigators).

Professors can manage and/or work on multiple projects. Each project is worked on by one or more graduate students (known as the project's research assistants). When graduate students work on a project, a professor must supervise their work on the project.Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one.

Departments have a department number, a department name, and a main office.Departments have a professor (known as the chairman) Professors work in one or more departments, and for each department that they work in, a time percentage is associated with their job.Graduate students have one major department in which they are working on their degree. Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take.

Design and draw an ER diagram that captures the information about the university.
Use only the basic ER model here; that is, entities, relationships, and

attributes.
Be sure to indicate any key and participation constraints

4) Define the following terms (10)

a)Entity set
b)Relationship
c)Derived attributes
d)Composite attributes

5) Discuss the following in relation algebra (10)

a) set intersection b) natural join c) division d) assignment

6) Consider a database with the following relations and write the SQL query statements (10)

loan (loan-number, branch-name, amount)
customer (customer-name, customer-street, customer-city)
depositor (customer-name, account-number)
borrower (customer-name, loan-number)
account (account-number, branch-name, balance)
branch (branch-name, branch-city, assets)

a) Find all customers who have both a loan and an account
b) Find all customers who have an account but no loan.
c) Find the average account balance at the Perryridge branch.
d) Find the number of tuples in the *customer* relation.
e) Find the number of depositors in the bank.

7) Briefly Discuss in SQL (10)
i. Drop and Alter Table constructs

ii. Domain types in SQL

8) Write short notes on (10)

a) Triggers with an example
b) Assertions

9) Explain BCNF with an example (10)

10) Explain Simple Lock based protocol concept with reference to Locks with an example (10)

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