Question Paper

Exam Date & Time: 24-Nov-2018 (02:00 PM - 05:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SCHOOL OF INFORMATION SCIENCES

FIRST SEMESTER M. Sc. INFORMATION SCIENCE

Database Management Systems [MIS 503]

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

END SEMESTER DEGREE EXAMINATION NOVEMBER 2018

Answer all the questions.

1) What are the different types of database end users? Discuss the main activities of each? (10)

[10 Marks]

2) What do you mean by Data model? Explain Hierarchical and Relational Data model in detail.[10 Marks] (10)

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

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
[10 Marks]

4) Explain the steps involved in the ER diagram into Relational Schema [10 Marks] (10)

5) Using the following relation "EMPLOYEE" write relational algebra query and explain the same. (10)

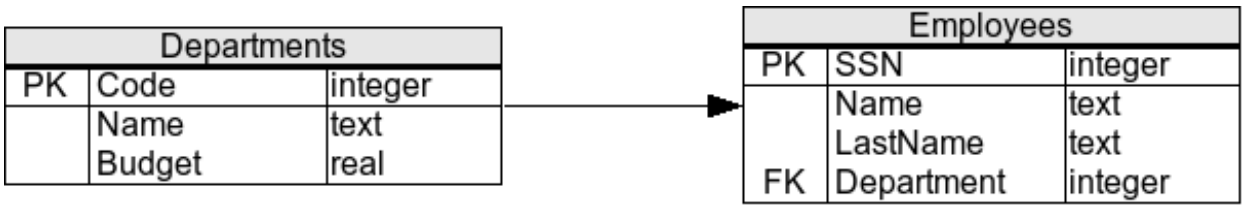
NAME	OFFICE	DEPARTMENT	RANK
Smith	400	Computer science	Assistant
Joe	220	Economics	Adjunct
Green	160	Economics	Assistant
Brown	420	Computer science	Associate
Smith	500	Electronics	Associate

a. Select only those Employees in the Computer Science department.
b. Select only those Employees with name Smith who are assistant.
c. Select only those Employees who are either Assistant or in the Economics department.
d. Select only those Employees who are not in the Computer Science department or Adjuncts.Show the name and rank of those.
e. Employees who are not in the Computer Science department or Adjuncts.

6) Consider the Sailors-Boats-Reserves relation write relation algebra querys (sid, sname, rating, age)
b (bid, bname, color)
r (sid, bid, date) (10)

a. Find the colours of boats reserved by Albert
b. Find all sailor id's of sailors who have a rating of at least 8 or reserved boat 103
c. Find the names of sailors who have not reserved a red boat
d. Find the names of sailors who have reserved all boats called BigBoat
[2.5X4=10 Marks]

7) Write SQL sub queries and explain based on the below relation (10)



a. Delete from the table all employees who work in departments with a budget greater than or equal to 60,000.
b. Select the names of departments with more than two employees.[5X2=10 Marks]

8) Explain the ALTER TABLE command. Explain how a new constraint can be added and also existing constraint can be removed, using suitable examples. [1X10=10 Marks] (10)

9) Define the term views. List out the advantages of it. Explain how to create and call views with an example. (10)

10) A software contract and consultancy firm maintains details of all the various projects in which its employees are currently involved. These details comprise: (10)

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.

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