JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Mid Term II Examination, October 2024
B. Tech. (CSE), Semester III, 2024-25

Roll No. 2023BTECH[redacted]

CS1133: Database Management Systems Time: 1.5 hour Max. Marks: 30

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Mention all the assumptions for your answers clearly.

Q. 1	The Jonesburgh County Basketball Conference (JCBC) is an amateur basketball association. Each city in the county has one team as its representative. Each team has a maximum of 12 players and a minimum of 9 players. Each team also has up to three coaches (offensive, defensive, and physical training coaches). During the season, each team plays two games (home and visitor) against each of the other teams. Given those conditions, do the following: 1. Identify the connectivity of each relationship. 2. Identify the type of dependency that exists between CITY and TEAM. 3. Identify the cardinality between teams and players and between teams and city. 4. Identify the dependency between coach and team and between team and player. 5. Draw the ERDs to represent the JCBC database.	*10 (LO1,2)*
Q.2	Consider the schema for Company Database: EMPLOYEE (SSN, Name, Address, Sex, Salary, SuperSSN, DNo) DEPARTMENT (DNo, DName, MgrSSN, MgrStartDate) DLOCATION (DNo,DLoc) PROJECT (PNo, PName, PLocation, DNo) WORKS_ON (SSN, PNo, Hours) Write SQL queries to 1) Make a list of all project numbers for projects that involve an employee whose last name is 'Kumar', either as a worker or as a manager of the department that controls the project. 2) Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise. 3) Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department 4) Retrieve the name of each employee who works on all the projects controlled by department number 5 (use NOT EXISTS operator). For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs.6,00,000. 5) Write a query in **Relational Algebra** , to display the details of all project along with their department name.	*(10 marks) (LO1,3,4)*

Q.3 | 10 marks (LO 1,2,3)

Suppose you are given the following business rules to form the basis for a database design. The database must enable the manager of a company dinner club to mail invitations to the club's members, to plan the meals, to keep track of who attends the dinners, and so on.

a) Each dinner serves many members, and each member may attend many dinners.
b) A member receives many invitations, and each invitation is mailed to many members.
c) A dinner is based on a single entree, but an entree may be used as the basis for many dinners. For example, a dinner may be composed of a fish entree, rice, and corn. Or the dinner may be composed of a fish entree, a baked potato, and string beans.
d) A member may attend many dinners, and each dinner may be attended by many members.

Because the manager is not a database expert, the first attempt at creating the database uses the structure shown in below Table

Attribute Name	Sample Values	Sample Values	Sample Values
MEMBER_NUM	214	235	214
MEMBER_NAME	Alice B. VanderVoort	Gerald M. Gallega	Alice B. VanderVoort
MEMBER_ADDRESS	325 Meadow Park	123 Rose Court	325 Meadow Park
MEMBER_CITY	Murkywater	Highlight	Murkywater
MEMBER_ZIPCODE	12345	12349	12345
INVITE_NUM	8	9	10
INVITE_DATE	23-Feb-08	12-Mar-08	23-Feb-08
ACCEPT_DATE	27-Feb-08	15-Mar-08	27-Feb-08
DINNER_DATE	15-Mar-08	17-Mar-08	15-Mar-08
DINNER_ATTENDED	Yes	Yes	No
DINNER_CODE	DI5	DI5	DI2
DINNER_DESCRIPTION	Glowing Sea Delight	Glowing Sea Delight	Ranch Superb
ENTREE_CODE	EN3	EN3	EN5
ENTREE_DESCRIPTION	Stuffed crab	Stuffed crab	Marinated steak
DESSERT_CODE	DE8	DE5	DE2
DESSERT_DESCRIPTION	Chocolate mousse	Cherries jubilee	Apple pie

Given the table structure illustrated in above Table, write the relational schema and draw its dependency diagram. Label all transitive and/or partial dependencies. (*Hint*: This structure uses a composite primary key.) Decompose your relational schema in 3NF.