**College of Applied Business and Technology**

**Sent-up Examination, March 2024**

**BIM / Fourth Semester / IT 220: Database Management System**

*Candidates are required to give their answers in their own words as far as practicable.*

**Section ‘A’ Time: 20 minutes**

**Brief answer questions. Attempt Any Ten. [10 × 1 = 10]**

1. Write any four application areas of DBMS.
2. List any four roles of DBA.
3. Differentiate between DDL and DML.
4. Define candidate key.
5. Differentiate between a weak entity and strong entity.
6. Write a syntax to rename a table name in SQL.
7. What is theta join?
8. Draw the state diagram of transaction.
9. Write the purpose of concurrency control?
10. When two phase locking result in deadlock?
11. Why only redo operation is done for recovery in recovery based on differed update?

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**Section ‘B’ Time: 30 minutes**

**Short answer questions. Attempt ANY TWO. [2 × 5 = 10]**

1. Differentiate between centralized and distributed system.
2. Determine the normal form of following **employee** table. If it is not in 3NF then normalize to 3NF.

**employee (EmpId, First\_Name, Last\_Name, Dept\_id, Department\_Name)**

Given functional dependencies:

EmpId🡪First\_Name  
EmpId 🡪Last\_Name

EmpId 🡪Dept\_id

Dept\_id 🡪Deptment\_Name

1. Explain the shared and exclusive lock along with lock-compatibility matrix.

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**Section ‘C’ Time: 80 minutes**

**Comprehensive answer questions. Attempt ANY TWO. [2 × 10 = 20]**

1. a) Explain the three schema (ANSI/SPARC) architecture with the help of diagram. [5]  
   b) Explain ACID properties of transaction in details. [5]
2. a) Explain specialization and generalization with example. [5]

b) Make an ER diagram containing entities Teachers, Students and Course making your own assumptions about attributes and cardinality constraints. [5]

1. a) Discuss any four fundamental operations of relational algebra. [4]

b) Assume a HR database of a Company. Where primary keys are underlined: [6×1=6]

**employees** (EmpID, FirstName, LastName, Salary, DeptID)

**departments** (DeptID, DeptName, LocationID)

**locations** (LocationID, StreetAddress, PostalCode, City, ProvinceNo)

Write the SQL queries for each of the following cases.

1. The HR department needs a report to display the employee number, first name, salary, and salary increased by 15% for each employee.
2. Write a query to display the last name, salary, department name of all employees whose department id is 26.
3. Write a query to display the first name, department ID, department name, city for all employees who works in Kathmandu.
4. Create a view for employees table named as **EmpView** with attributes EmpID, FirstName and Salary.
5. Insert a single row in department table with data (40, sales, 102).
6. Update the salary of employee with 50000 whose EmpID is 220.