

# Pre-board Examination - 2024

**Subject: IT 220: Database Management System FM: 60**

**Semester: BIM 4th Semester Time: 3 hrs**

**Group A**

**Brief Answer Question: [1\*10=10]**

**Attempt all the Questions.**

1. What do you mean by the term “Schema and Instances”?
2. Explain with example of simple and composite attribute.
3. What is data recovery?
4. Write down the syntax for Rename operation in SQL.
5. How do you verify that intersection is derived operation?
6. How does data differ from information?
7. What is the primary function of Transaction Control Language in a database?
8. Define serial schedule.
9. What is deferred update and shadow paging?
10. Define data ware housing and data mining.

**Group B**

**Short Answer Question: [5\*3=15]**

**Attempt any five Questions**

1. What do you mean by Database Users? Explain different database users.
2. Define Anomalies. Explain Insert, Update and Delete Anomalies.
3. Why having clause is used although we have where clause? Explain with example
4. What do you mean by keys? Explain difference between primary key and candidate key
5. Do you think views are necessary in database although we have tables? Justify your opinion by creating a view from the base table
6. What do you mean by transaction? Explain transaction states.

**Group C**

**Long Answer Questions: [3\*5=15]**

**Attempt any three Questions**

1. What do you mean by integrity constraints? Explain different types of constraints.
2. Consider a relation R (A, B , C , D , E , F , G ) with the functional dependencies

A → BC, BC → DE, D → F, CF → G. Find the super key, candidate key and primary key for the given relation with explaining each step.

1. Do you think NoSQL should be adopted by the big companies rather and SQL? Explain. Also explain how big data helps to manage the data in those companies.
2. What do you mean by concurrency control? Explain locking protocol with the help of 2PL using suitable example.

**Group D**

**Comprehensive Questions [2X10=20]**

**Attempt all questions.**

* 1. Suppose you are tasked with designing a database for a university's course registration system. The system needs to keep track of students, courses, instructors, and the enrollment of students in courses. Each student has a unique student ID, a name, and a year of study. Each course has a unique course code, a title, and a credit value. Each instructor has a unique instructor ID, a name, and a department. Design an ER diagram for this system, including the entities, attributes, and relationships between them. Ensure that the diagram represents the following constraints:
     1. Each student can enroll in multiple courses.
     2. Each course can have multiple students enrolled.
     3. Each course is taught by one instructor.
     4. An instructor can teach multiple courses.
     5. Indicate primary keys and foreign keys where applicable
  2. What is normalization? Explain 1NF, 2NF, 3NF and BCNF with suitable examples.

1. Consider a university database with three tables, where the primary keys are underlined as given below:

student(SID, SName, SAddress, SEmail)

studies(SID, CID)

course(CID, CNname, Credit\_hours)

Give an expression in SQL and RA for each of the following queries (b to c)

a. Write DDL command for each entity given above (2)

b. Insert data with values “S101”, “Ram”, “Lalitpur”, and “ram@abc.com” in the student table. (2)

c. Find names of all students whose address is “Kathmandu”. (2)

d. Count number of students who study “Database Management System”. (2)

e. Find names of all courses with credit hours greater than or equal to 3. (2)