

USN

|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|

15CS53

## Fifth Semester B.E. Degree Examination, July/August 2022 Database Management System

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. What is database? What are the advantages of using DBMS approach? (08 Marks)  
b. With a neat diagram, explain "three schema architecture". (08 Marks)

OR

- 2 a. Explain the following :  
i) Composite versus Simple attributes  
ii) Single Valued Versus Multivalued attributes  
iii) Stored versus Derived attributes  
iv) Null values. (08 Marks)  
b. Write an ER diagram for Hotel Management System considering atleast 4 entities. (08 Marks)

### Module-2

- 3 a. Explain the three basic update operations on relations with example for each. (08 Marks)  
b. Explain the Relational Algebra Operations from set Theory. (08 Marks)

OR

- 4 a. Consider the following schema and write relational algebra expressions for the queries given below :  
Employee (Fname, Minit, Lname, SSN, Bdate, Address, Sex, Salary, Super\_SSN, Dno)  
Department (Dname, Dnumber, Mgr\_SSN, Mgr\_Start\_date)  
Dept\_Location (Dnumber, Dlocation)  
Project (Pname, PNumber, Plocation, Dnum)  
Works\_ON (ESSN, Pnumber, Hours)  
Dependent (ESSN, Dependent\_name, Sex, Bdate, Relationship).  
i) Retrieve the name and address of all employees who work for the 'Research' department.  
ii) Find the names of employees who work on all the projects controlled by department number 5.  
iii) Retrieve the names of employees who have no dependents.  
iv) List the names of employees with two or more dependents. (08 Marks)  
b. Explain the different constraints that can be applied on database with example. (08 Marks)

### Module-3

- 5 a. Considering the same schema given in question 4a write the following queries in SQL.  
i) Retrieve the birth data and address of the employee(s) whose name is 'Joh. B. Smith'.  
ii) For each employee, retrieve the employee's first and last name and the first and last name of his/her immediate supervisor.  
iii) Retrieve all employees whose address is in Houston, Texas.  
iv) Retrieve all employees in department 5 whose salary is between \$30,000 and \$40,000  
v) Retrieve the names of all employees who do not have supervisors. (10 Marks)  
b. What is a view? Explain with example how views are created and dropped. (06 Marks)

OR

- 6 a. What is JDBC? Explain the various JDBC classes and interfaces. (08 Marks)  
b. What are Assertions and Triggers? Explain with example how Assertions and Triggers are created. (08 Marks)

**Module-4**

- 7 a. Discuss insertion, deletion and modification anomalies. Why are they considered bad? Illustrate with example. (08 Marks)  
b. Define functional dependency. Explain the inference rules for functional dependency. (08 Marks)

OR

- 8 a. Which normal form is based on the concept of multivalued functional dependency? Explain the same with example. (08 Marks)  
b. Define Boyce Codd Normal Form. Explain with example. Why BCNF is considered as stricter than 3NF. (08 Marks)

**Module-5**

- 9 a. Explain the desirable properties of transactions. Also explain different transaction states. (08 Marks)  
b. Explain two phase locking techniques for concurrency control. (08 Marks)

OR

- 10 a. Explain recovery techniques based on deferred update. (08 Marks)  
b. Explain shadow paging database recovery concept. Also mention catastrophic failures. (08 Marks)

\*\*\*\*\*