

# CBCS SCHEME

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17CS53

## Fifth Semester B.E. Degree Examination, Jan./Feb. 2023 Database Management System

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain the main characteristics of the database approach versus the file processing approach. (08 Marks)
- b. Explain the three-schema architecture with neat diagram. Why do we need mapping among schema levels? How do different schema definition languages support this architecture? (08 Marks)
- c. Discuss the different types of user friendly interfaces and the types of user who typically use each. (04 Marks)

OR

- 2 a. Explain with block diagram the different phases of database design. (08 Marks)
- b. Design an E-R diagram for keeping track of information about a company database taking into account of least five entities. (08 Marks)
- c. List the advantages of DBMS. (04 Marks)

### Module-2

- 3 a. Describe the characteristics of relations with suitable example for each. (08 Marks)
- b. In SQL which command is used for table creation? Explain with an example along with the constraint specification. (08 Marks)
- c. Explain the data types available for attribute specification in SQL. (04 Marks)

OR

- 4 a. Explain any five relational algebra operators along with their syntax and purpose. (10 Marks)
- b. Explain the steps of an algorithm for ER-to-relational mapping. (10 Marks)

### Module-3

- 5 a. Explain the syntax of creating and updating views in SQL and give examples for each. (10 Marks)
- b. Draw and explain 3-tier architecture and technology relevant to each tier. Write the advantages of 3-tier architecture. (10 Marks)

OR

- 6 a. Consider the following company database:  
EMP (Name, SSN, Salary, SuperSSN, Dno)  
DEPT (DNum, Dname, MgrSSN, Dno)  
DEPT\_LOC (Dnum, Dlocation)  
DEPENDENT (ESSN, Dep\_name, Sex)  
WORKS\_ON (ESSN, Pno, Hours)  
PROJECT (Pname, Pnumber, Plocation, Dnum)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Write the SQL queries for the following:

- (i) Retrieve the name of the employee who works with same department as ravi. (10 Marks)
  - (ii) Retrieve the number of departments for an employee "Ravi" (06 Marks)
  - (iii) Retrieve the name of the managers working in location "DELHI" who has no female dependents. (04 Marks)
  - (iv) List female employees from Dno = 20 earning more than 50,000.
  - (v) List "CSE" department details.
- b. What is SQLJ? How it is different from JDBC? (06 Marks)
- c. What is Dynamic SQL and how is it different from embedded SQL? (04 Marks)

**Module-4**

- 7 a. Define normal form. Explain 1NF, 2NF and 3NF with suitable examples for each. (08 Marks)
- b. Explain the informal design guidelines used as measures to determine the quality of relation schema design. (08 Marks)
- c. Define multivalued dependency. Explain fourth normal form with an example. (04 Marks)

**OR**

- 8 a. Discuss the null value and dangling tuple problems. (08 Marks)
- b. Explain the concept of BCNF. (08 Marks)
- c. Explain properties of relational decomposition. (04 Marks)

**Module-5**

- 9 a. Discuss the desirable properties of transactions. (08 Marks)
- b. Explain transaction support in SQL. (08 Marks)
- c. What is two-phase locking protocol? How does it guarantee serializability? (04 Marks)

**OR**

- 10 a. Explain: (10 Marks)
- (i) Multi version concurrency control protocols
  - (ii) Shadow paging
- b. Explain: (10 Marks)
- (i) NO-UNDO/REDO Recovery based on deferred update
  - (ii) Recovery techniques based on immediate update

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