

GBCS SCHEME

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18CS53

Fifth Semester B.E. Degree Examination, June/July 2025 Database Management Systems

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain three schema architecture and reason for need of mapping among schema level. (08 Marks)
- b. List and discuss advantages of Database Management system over file processing system. (06 Marks)
- c. Explain different types of attributes that occur in an E – R diagram model with example. (06 Marks)

OR

- 2 a. Draw an ER diagram of Banking Database. Assume your own entities (minimum 4), Attributes and relationship specifies 3 NF. (14 Marks)
- b. Explain with the block diagram, the different phases of database design. (06 Marks)

Module-2

- 3 a. Explain the different Relational model constraints. (06 Marks)
- b. Explain the concepts of Specialization and Generalization with the help of VEHICLE super class. (08 Marks)
- c. Explain the entity integrity and referential integrity constraints. Why is each considered important. Give example. (06 Marks)

OR

- 4 a. Define the following terms : i) Key ii) Super key iii) Candidate key iv) Primary key v) Foreign key. (05 Marks)
- b. Write SQL syntax for the following with example : i) SELECT ii) ALTER iii) UPDATE. (05 Marks)

- c. Consider the following relation schema :

Works (Pname , Cname , Salary)

Lives (Pname , Street , City)

Located_in (Cname , City)

Manager (Pname , Mgrname)

Write the SQL queries for the following :

- i) Find the names of all persons who lives in the city of Bangalore.
- ii) Retrieve the names of all persons of “Infosys” whose salary is between Rs 50000 and 1,00,000.
- iii) Find the names of all persons who lives and work in the same city.
- iv) List the names of the people who work for “Tech M” along with cities they live in.
- v) Find the average salary of “Infosys” persons. (10 Marks)

Module-3

- 5 a. How are assertions and triggers defined in SQL? Explain with examples. (08 Marks)
- b. Explain stored procedures in SQL with an example. (06 Marks)
- c. List out and explain the different types of JDBC drivers. (06 Marks)

OR

- 6 a. What is a three – tier architecture? What advantages it offers over single tier and two tier architecture? Give a short overview of the functionality at each of the three – tier. (10 Marks)
- b. How to create views in SQL? Explain with an example. (06 Marks)
- c. What is SQLJ? How it is different from JDBC? (04 Marks)

Module-4

- 7 a. What is the need for normalization? Explain 1NF , 2NF and 3NF with example. (08 Marks)
- b. What do you understand by Attribute closure? Give an example. (04 Marks)
- c. Explain an informal design guidelines for relational schema design. (08 Marks)

OR

- 8 a. Define 4NF. When it is violated? Why is it useful? (06 Marks)
- b. What is Functional dependency? Explain the inference rules for functional dependency with proof. (08 Marks)
- c. Consider two sets of functional dependency.
 $F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H\}$
 $G = \{A \rightarrow CD, E \rightarrow AH\}$. Are they equivalent? (06 Marks)

Module-5

- 9 a. Discuss the UNDO and REDO operations and the recovery techniques that use each. (06 Marks)
- b. Why concurrency control is needed? Demonstrate with an example. (10 Marks)
- c. Explain the ACID properties of a database transaction. (04 Marks)

OR

- 10 a. When deadlock and starvation problem occur? Explain how these problems can be resolved? (10 Marks)
- b. Discuss Two –phase locking techniques for concurrency control. (10 Marks)

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