CBCS SCHEME

USN | | | | | | | | | | |

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 cites 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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