CBCS SCHEME

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BCS755A

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Introduction to DBMS

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Define Database. List and briefly explain the advantages of using DBMS approach.	10	L2	CO1
	b.	Define DBMS. Discuss the characteristics of the database approach.	5	L2	CO1
	c.	With neat diagram, explain the three schema architecture.	5	L2	CO1
		OR			
Q.2	a.	Explain the component module of DBMS and their interactions with the help of neat diagram.	10	L2	CO1
	b.	Define the following terms: i) Weak entity ii) DBMS catalog iii) Value sets iv) Cardinality ratio v) Degree of a relationship	10	L2	CO1
		Module – 2			
Q.3	a.	Build an ER diagram of company system taking into account at least four entities. Indicate all keys, constraints and assumptions that are made.	10	L3	CO2
	b.	With an example, explain the steps of ER to relational mapping algorithm.	10	L2	CO2
		OR			
Q.4	a.	Build an ER diagram for university database by considering atleast 5 entities.	10	L3	CO2
	b.	Illustrate specialization and generalization with example.	10	L2	CO2

		Module – 3			
Q.5	**a.**	Explain about relational model constraints.	**10**	**L2**	**CO3**
	b.	By refereeing the following database schema: EMPLOYEE (Fname, Minit, Lname, SSN, Bdate, Address, Sex, Salary, Sup-SSN, Dno) Department (Dname, Dnumber, Mgr-SSN, Mgr-start-date) Dept-Locations (Dnumber, Dlocation) Project (Pname, Pnumber, Plocation, Dnum) Works – on (Essn, Pno, Hours) Dependent (Essn, Dependent-name, sex, Bdate, Relationship) Show the relational algebra expressions for the following queries. i) Retrieve the name and address of all employees who work for the 'Research' department. ii) Make a list of all project numbers for projects that involve an employee whose last name is 'Smith' either as a worker or as a manager of the department that controls the project. iii) List the names of managers who have at least one dependent. iv) Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. v) For each project, retrieve the project number, the project name, and the number of employees who work on that project.	**10**	**L3**	**CO3**
		OR			
Q.6	**a.**	Explain how the basic operations deal with constraints violations with example.	**10**	**L2**	**CO3**
	b.	Explain Division operation with example.	**10**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Explain INSERT, DELETE, UPDATE statements in SQL taking suitable examples.	**10**	**L2**	**CO3**
	b.	What is Normalization? Explain 1NF, 2NF and 3NF with examples.	**10**	**L2**	**CO4**

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		OR			
Q.8	**a.**	List and explain informal design guidelines for relation schemas.	**10**	**L2**	**CO4**
	b.	By refereeing the following database schema: Employee (Fname, Minit, Lname, SSN, Bdate, Address, Sex, Salary, Sup-SSN, Dno) Department (Dname, Dnumber, Mgr-SSN, Mgr-start-date) Dept-Locations (Dnumber, Dlocations) Project (Pname, Pnumber, Plocation, Dnum) Works-on (Essn, Pno, Hours) Dependent (Essn, Dependent-Name, Sex, Bdate, Relationship) Write queries in SQL i) Retrieve all the employee names who are working for department number 5. ii) Retrieve all the projects which are controlled by department number 4 iii) Retrieve the names of employees who have no dependents iv) Retrieve the employee name who is working on all the projects in which 'John Smith' works on. v) Retrieve all the project numbers along with number of employee working on each project.	**10**	**L3**	**CO3**
		Module – 5			
Q.9	**a.**	How are triggers and assertions defined in SQL? Explain.	**10**	**L2**	**CO3**
	b.	Discuss the Two-Phase locking techniques for concurrency control.	**10**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain views in SQL with example.	**10**	**L2**	**CO3**
	b.	Explain validation concurrency control techniques in databases.	**10**	**L2**	**CO5**

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