

CBCS SCHEME

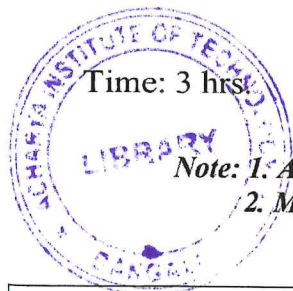
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BCS755A

Seventh Semester B.E./B.Tech. Degree Examination, June/July 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.	Explain the following terms with examples: i) Schema ii) Entity iii) DDL iv) Degree of a relationship		4	L2	CO1
	b.	Define Database. Explain the component modules of DBMS and their interactions.		10	L3	CO1
	c.	Explain the advantages of using DBMS approach.		6	L3	CO1
OR						
Q.2	a.	With the help of a neat diagram, explain 'Three Schema Architecture' and data dependence.		6	L3	CO1
	b.	Explain the characteristics of database approach.		8	L3	CO1
	c.	Explain different types of end users.		6	L2	CO1
Module – 2						
Q.3	a.	Draw an ER diagram for a COMPANY database with EMPLOYEE, DEPARTMENT, PROJECT as strong entities and DEPENDENT as weak entity. Specify the constraints, relationships and ratios in ER diagram.		10	L3	CO2
	b.	Explain strong and weak entity types with examples.		5	L2	CO2
	c.	Define Cardinality Ratio. Explain cardinality ratio of binary relationships with examples.		5	L3	CO2

OR

Q.4	a.	Explain ER to relational mapping of 1:1 binary relationship, multivalued attributes and weak entity types.	10	L3	CO2
	b.	Define the following terms with examples for each using ER notations: multivalued attribute, participation role.	4	L2	CO2
	c.	Define Specialization and Generalization and explain their mapping.	6	L3	CO2

Module – 3

Q.5	a.	Explain Insert, Delete and Update operations and their constraints in dealing with violations.	10	L3	CO3
	b.	Consider the database schema given EMPLOYEE (Fname, Lname, <u>ssn</u>, Address, Salary, Bdate, Super_ssn, Dno) DEPARTMENT (Dname, <u>Dnumber</u>, Mgr_ssn) WORKS_ON (<u>Essn</u>, <u>Pno</u>, Hours) PROJECT (Pname, <u>Pnumber</u>, Plocation, Dnum) DEPENDENT (<u>Essn</u>, <u>Dependent_Name</u>, Relationship) Write relational algebra queries to perform following operations: i) Retrieve the name and address of all employees who work for the 'Accounts' department. ii) Retrieve the names of employees who have no dependents. iii) Find the names of employees who work on all the projects controlled by department no.2 iv) For every project located in "Stafford", list the project number, controlling department number, department manager's last name, address and birth date.	10	L3	CO3

OR

Q.6	a.	Explain INNER JOIN, OUTER JOIN and NATURAL JOIN operations with examples.	10	L3	CO3
	b.	Explain with examples SELECT, PROJECT, MINUS operations and AGGREGATE functions and grouping.	10	L3	CO3

Module – 4

Q.7	a.	List the data types that are allowed for SQL attributes with example for each.	10	L2	CO4																									
	b.	Define Boyce-Codd normal form. How does it differ from 3NF? Why is it considered a stronger form of 3NF?	6	L2	CO4																									
	c.	Identify the given Relation R (ABCDE) and its instance, check whether FDs given hold or not. Give reasons i) $A \rightarrow B$ ii) $B \rightarrow C$ <table border="1"><thead><tr><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th></tr></thead><tbody><tr><td>a₁</td><td>b₁</td><td>c₁</td><td>d₁</td><td>e₁</td></tr><tr><td>a₁</td><td>b₂</td><td>c₁</td><td>d₁</td><td>e₁</td></tr><tr><td>a₂</td><td>b₂</td><td>c₁</td><td>d₂</td><td>e₃</td></tr><tr><td>a₂</td><td>b₃</td><td>c₃</td><td>d₂</td><td>e₃</td></tr></tbody></table>	A	B	C	D	E	a ₁	b ₁	c ₁	d ₁	e ₁	a ₁	b ₂	c ₁	d ₁	e ₁	a ₂	b ₂	c ₁	d ₂	e ₃	a ₂	b ₃	c ₃	d ₂	e ₃	4	L3	CO4
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OR

Q.8	a.	Illustrate informal guidelines for relationship schema with examples.	10	L2	CO4
	b.	Explain the three commands used to modify the database in SQL.	6	L2	CO4
	c.	How are key and referential integrity constraints specified in SQL?	4	L3	CO4

Module – 5

Q.9	a.	Explain the timestamp ordering protocol for concurrency control. Explain Thomas Write rule and how it varies from basic time stamp ordering algorithm.	10	L3	CO5
	b.	Describe the six clauses in the syntax of an SQL retrieval query.	10	L2	CO5

OR

Q.10	a.	Describe two multiversion techniques for concurrency control. What is a certify lock? What are the advantages and disadvantages of using certify locks.	10	L2	CO5
	b.	Explain how each of the following constructs is used in SQL-Nested queries, SQL WITH and CASE constructs.	10	L3	CO5
