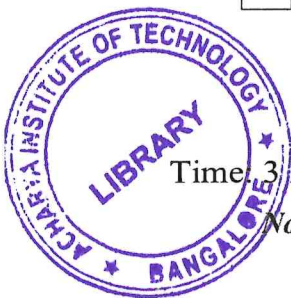


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First Semester MCA Degree Examination, June/July 2026 Database Management System (DBMS)

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.	What is a Database Management System (DBMS)? Discuss the key characteristics of the database approach compared to the traditional file-based approach.	10	L2	CO1
	b.	Explain the different types of attributes in the Entity-Relationship (ER) model with an example for each.	10	L2	CO1
OR					
Q.2	a.	Describe the three-schema architecture of DBMS with a neat diagram.	10	L2	CO1
	b.	Summarize the ER design issues with suitable example of company database.	10	L2	CO1
Module – 2					
Q.3	a.	Illustrate SELECT and PROJECT operations with an example for each.	8	L3	CO2
	b.	What are Views in SQL? Give an example.	4	L1	CO2
	c.	Explain the importance of ORDER BY, GROUP BY clauses with examples.	8	L2	CO2
OR					
Q.4	a.	Consider the following database where the primary keys are underlined EMPLOYEE(Dname, Lname, <u>Ssn</u> , Bdate, Address, Gender, Salary, SuperSsn, Dno) DEPARTMENT(Dname, <u>Dnumber</u> , Mgr_Ssn, Mgr_strt_date) Answer the following queries in Relational Algebra. i) Retrieve the name and address of all employees who work for the "research" department ii) Retrieve the first name, Last name, and salary of all employees who work in department number 5.	8	L4	CO2
	b.	Discuss aggregate functions in SQL with an example.	4	L2	CO2
	c.	Describe Join and Division Operation with an example for each.	8	L2	CO2

Module – 3					
Q.5	a.	What is normalization? Explain the concept of 1NF, 2NF with an example.	10	L2	CO3
	b.	Explain the importance of BCNF with suitable example.	10	L2	CO3
OR					
Q.6	a.	What is lossless decomposition? Explain functional dependency with an example.	10	L2	CO3
	b.	Illustrate 4NF and 5NF with an example.	10	L2	CO3
Module – 4					
Q.7	a.	Define transaction? Describe the desirable properties of transactions	10	L2	CO4
	b.	With the help of shadow copy technique, explain atomicity and durability.	10	L2	CO4
OR					
Q.8	a.	Discuss transaction states with a neat diagram.	10	L2	CO4
	b.	What do you mean by serializability? Explain the techniques to test serializability.	10	L2	CO4
Module – 5					
Q.9	a.	Explain the concept of Immediate Log-Based Recovery in DBMS with a suitable example.	10	L2	CO5
	b.	Describe the significance of checkpoints in the database recovery process.	10	L2	CO5
OR					
Q.10	a.	Explain the recovery process in a DBMS , when multiple transactions are executed concurrently.	10	L2	CO5
	b.	Describe the failure scenario involving the loss of non-volatile storage and explain how recovery is handled in such cases.	10	L2	CO5

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