

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZINAGARAM
III B. Tech I Semester Regular Examinations November -2025
DATABASE MANAGEMENT SYSTEMS
(ME)

Time: 3 hours

Max. Marks: 70

The Question paper consists of Part A & Part B.

Part A is compulsory, Answer all questions. Part B Answers any one question from each unit.

1		PART-A	(20Marks)
	a)	Define data independence and explain its types.	[2]
	b)	What are the responsibilities of a Database Administrator (DBA)?	[2]
	c)	Define entity and relationship in an ER model.	[2]
	d)	What are primary key and foreign key constraints?	[2]
	e)	What is the purpose of normalization?	[2]
	f)	Define trigger and give its syntax in SQL.	[2]
	g)	Explain the concept of a transaction in DBMS.	[2]
	h)	What is deadlock in concurrency control?	[2]
	i)	Define indexing and state its purpose in databases.	[2]
	j)	What is hashing? Differentiate between static and dynamic hashing.	[2]
		PART-B	(50Marks)
		Question from Unit - I	
2	a)	Explain the architecture of a database system with a neat diagram.	[5]
	b)	Describe the three levels of database architecture and explain how data independence is achieved.	[5]
		(OR)	
3	a)	Discuss the role of a Database Administrator (DBA) in maintaining and controlling a database system.	[5]
	b)	Explain the client-server architecture in DBMS and its advantages.	[5]
		Question from Unit - II	
4	a)	Draw an ER diagram for an online shopping system and explain the various entities, relationships, and attributes.	[5]
	b)	Explain different types of constraints (domain, key, and foreign key) with examples.	[5]
		(OR)	
5	a)	Discuss the fundamental operations of relational algebra with suitable examples.	[5]
	b)	Differentiate between tuple relational calculus and domain relational calculus.	[5]
		Question from Unit - III	
6	a)	Explain the use of aggregate operators, nested queries, and set operations in SQL with examples.	[5]
	b)	Discuss different types of normal forms (1NF, 2NF, 3NF, BCNF) with examples.	[5]
		(OR)	

7	a)	What are triggers? Explain their types and uses in maintaining data integrity.	[5]
	b)	Explain the concept of functional dependency. How does it help in normalization?	[5]
		Question from Unit - IV	
8	a)	Define concurrency control. Explain two-phase locking (2PL) protocol and how it ensures serializability.	[5]
	b)	Describe different types of transaction failures and recovery mechanisms in DBMS.	[5]
		(OR)	
9	a)	Discuss timestamp-based concurrency control methods – Wait/Die and Wound/Wait.	[5]
	b)	Explain commit, rollback, and savepoint commands in SQL with examples.	[5]
		Question from Unit - V	
10	a)	Explain different types of indexing techniques – primary, secondary, and clustered	[5]
	b)	Describe hash-based indexing and its working principle with examples	[5]
		(OR)	
11	a)	Compare file organization methods: heap file, sequential file, and indexed file organization.	[5]
	b)	Explain tree-based indexing and how B+ trees improve data retrieval performance.	[5]
