Course Code: 20MC9111 **R20**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583
QUESTION BANK (DESCRIPTIVE)

Subject with Code: Database Management System(20MC9111) **Course & Branch**: MCA

Regulation: R20 **Year & Sem:** I-MCA & II-Sem

UNIT –I
DBMS INTRODUCTION, ER MODEL

1	**a)**	What do you mean by Database Management System?	[L1][CO1]	**[6M]**
	b)	Explain various advantages of using a DBMS.	[L2][CO1]	**[6M]**
2	**a)**	What are the problems in file system data management?	[L1][CO1]	**[6M]**
	b)	Explain various applications of DBMS.	[L2][CO1]	**[6M]**
3	**a)**	List out various Levels of Abstraction.	[L1][CO2]	**[3M]**
	b)	What are the different types of data model? Explain each briefly.	[L1][CO2]	**[9M]**
4		Discuss the three schema architecture with block diagram. Why do we need mappings between schema levels?	[L6][CO1]	**[12M]**
5		Illustrate and explain the components of a DBMS.	[L2][CO1]	**[12M]**
6		List and explain Mapping Cardinalities with an example ER diagrams.	[L4][CO1]	**[12M]**
7	**a)**	Define Entity. Explain types of Entity Set.	[L2][CO2]	**[6M]**
	b)	Explain Relationship set with its types.	[L2][CO2]	**[6M]**
8		Define attribute. Explain different types of attributes in details with example.	[L5][CO2]	**[12M]**
9		List various notations of E/R diagram with example.	[L4][CO2]	**[12M]**
10		Explain the following attributes with ER Notations **i)** Simple **ii)** Multi-Valued **iii)** Composite **iv)** Derived	[L2][CO2]	**[12M]**

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UNIT –II
RELATIONAL DATA MODEL

1	**a)**	Define Relational Data model and its concepts.	[L1][CO2]	**[6M]**
	b)	Explain in detail about Entity and Referential Integrity?	[L2][CO2]	**[6M]**
2		Define and Explain the following with an example. i. Super Key ii. Candidate Key iii. Primary Key iv. Foreign Key	[L1][CO2]	**[12M]**
3		Discuss various Relation Algebra Operators with examples.	[L6][CO2]	**[12M]**
4		Consider the relations COLLEGE (CNAME, STATE, ENROLLMENT) STUDENT(SID, SNAME, GPA, AGE) APPLY(SID, CNAME, MAJOR, DECISION) Construct Relational Algebra Expressions for the following queries i. Find the students whose GPA is greater than 7 and age is 25. ii. Find the students who join in sietk college with MCA as major. iii. Display names and GPA'S of students with age 25 who applied to MBA and where rejected. iv. List out the college names located in AP. v. Pick the students id and names whose GPA is lessthan 5 or age > 28.	[L3][CO2]	**[12M]**
5		Explain in detail about Relational Calculus and with their types	[L2][CO2]	**[12M]**
6		Design an ER diagram for relations Employee and Department with relationships.	[L6][CO3]	**[12M]**
7		Consider the relations STUDENT(RNO, SNAME, ADDRESS) TEACHERS(TID, TNAME, TSUBJECTS) COLLEGE(RNO, TID) Construct Relational Algebra Expressions for the following queries i. Find the names of students who live in chittoor. ii. Find the names of teachers who teaches' DS. iii. Insert a new tuple into teacher relation. iv. Delete record of students whose address is "TPT". v. Find the students and teachers whose names are same.	[L3][CO3]	**[12M]**
8	**a)**	What is join? Explain Natural join with example.	[L2][CO2]	**[6M]**
	b)	List and explain outer join operations with example.	[L2][CO2]	**[6M]**
9	**a)**	Explain Selection and Projection Operation with example.	[L2][CO2]	**[6M]**
	b)	Explain Union and Set Difference Operations with example.	[L2][CO2]	**[6M]**
10		Identify the steps for converting the E R Diagram to Relational Schema.	[L3][CO3]	**[12M]**

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UNIT –III
SQL, QUERYING IN SQL

1	**a)**	List out various Data Definition Language commands with Syntax & examples.	[L4][CO4]	**[6M]**
	b)	List out various Data Manipulation Language commands with Syntax & examples.	[L4][CO4]	**[6M]**
2		Explain about Keys and Constraints in SQL with example.	[L2][CO4]	**[12M]**
3	**a)**	What are different Alter Commands in SQL? Explain with example.	[L1][CO4]	**[6M]**
	b)	What are different ways to insert row into the table? Explain with example.	[L1][CO4]	**[6M]**
4	**a)**	Explain basic structure of SQL expression with examples.	[L5][CO4]	**[6M]**
	b)	Explain advanced SELECT Queries with examples.	[L5][CO4]	**[6M]**
5	**a)**	Illustrate Nested Queries with an example.	[L2][CO4]	**[6M]**
	b)	Demonstrate various Aggregate Functions with example.	[L2][CO4]	**[6M]**
6		Explain the following with examples **i)** HAVING **ii)** GROUP BY **iii)** Sub – Queries	[L2][CO4]	**[12M]**
7		Consider the following relational schema: COLLEGE (CNAME, STATE, ENROLLMENT) STUDENT(SID, SNAME, GPA, AGE) APPLY(SID, CNAME, MAJOR, DECISION) Construct SQL Query for the following queries. i. Find the students whose GPA is greater than 7 and age is 25. ii. Find the students who join in sietk college with MCA as major. iii. Display names and GPA'S of students with age 25 who applied to MBA and where rejected. iv. List out the college names located in AP. v. Pick the students id and names whose GPA is lessthan 5 or age > 28.	[L3][CO4]	**[12M]**
8		Write queries using Relational Set operators and SQL Join operators.	[L1][CO4]	**[12M]**
9	**a)**	Classify SQL Functions. Explain String functions with explanations.	[L4][CO4]	**[6M]**
	b)	Explain Numeric Functions in SQL with example.	[L2][CO4]	**[6M]**
10		Consider the following relational schema: BATCH1(SID, SNAME, AGE, GENDER, CITY) BATCH2(SID, SNAME, AGE, GENDER, CITY) Construct SQL Query for the following queries i. Find the Batch1 students whose age is more than 25. ii. Display the Batch2 students. iii. Find the female students from Batch1 or the students living in ptr. iv. Display both batch students' details. **v.** Find the names of batch1 students who are living in tpt.	**[L3][CO4]**	**[12M]**

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UNIT –IV
DEPENDENCIES AND NORMAL FORMS

1		Explain Armstrong's axioms in functional dependencies with example.	[L5][CO4]	**[12M]**
2	**a)**	What is Functional Dependencies?	[L1][CO4]	**[4M]**
	b)	Discuss about different functional dependencies with examples.	[L6][CO4]	**[8M]**
3	**a)**	What are the problems caused by Redundancy?	[L1][CO4]	**[6M]**
	b)	Explain about Normalization and need for normalization.	[L2][CO4]	**[6M]**
4	**a)**	Define Normalization.	[L1][CO4]	**[3M]**
	b)	Compare and explain about 1NF, 2NF with relevant examples.	[L4][CO4]	**[9M]**
5		Explain about 3NF and BCNF with relevant table structure.	[L5][CO4]	**[12M]**
6		Explain the Multi-valued dependencies and fourth normal forms.	[L2][CO5]	**[12M]**
7		List and explain various normal forms with example.	[L4][CO5]	**[12M]**
8		Discuss various Inference rules with an example.	[L6][CO5]	**[12M]**
9		Explain the following terms **i)** Fully functional Dependencies **ii)** Transitive Dependencies	[L2][CO5]	**[12M]**
10		Explain the steps to improving the design of a Database.	[L5][CO5]	**[12M]**

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UNIT –V
DATA STORAGE & INDEXES, TRANSACTION PROCESSING & ERROR RECOVERY

1	**a)**	What is meant by File Organization?	[L1][CO6]	**[4M]**
	b)	Briefly discuss different types of file organization.	[L6][CO6]	**[8M]**
2	**a)**	Write about Index file organization.	[L1][CO6]	**[6M]**
	b)	List various index structures.	[L4][CO6]	**[6M]**
3		Discuss about Hashing in detail with merits and demerits.	[L6][CO6]	**[12M]**
4	**a)**	What is a transaction in database system?	[L1][CO6]	**[3M]**
	b)	List and explain the ACID Properties with neat diagram.	[L4][CO6]	**[9M]**
5		List and explain different concurrency control.	[L4][CO6]	**[12M]**
6		Explain lock-based concurrency control mechanisms with diagram in detail.	[L5][CO6]	**[12M]**
7		Explain about concurrency control based on time-stamp ordering.	[L2][CO6]	**[12M]**
8		Explain the following concepts **i)** Transaction States **ii)** Concurrent Executions	[L2][CO5]	**[12M]**
9		Explain the following in transaction failures **i)** Failure Classification **ii)** undo and redo	[L2][CO5]	**[12M]**
10		Explain log-Based Recovery in detail.	[L5][CO6]	**[12M]**

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