NARASIMHA REDDY ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad

Accredited by NAAC with A Grade, Accredited by NBA

Computer Science & Engineering (CS)

QUESTION BANK

Course Title : **DATABASE MANGEMENT SYSTEM**

Course Code : **CY3103PC**

Regulation :R21

Course Objectives:

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

Course Outcomes (CO's)

- Gain knowledge of fundamentals of DBMS, database design and normal forms
- Master the basics of SQL for retrieval and management of data.
- Be acquainted with the basics of transaction processing and concurrency control
- . Familiarity with database storage structures and access techniques

UNIT–I

S.No	Questions	BT	CO	PO
	Part – A (Short Answer Questions)			
1	What is database?	L1	CO1	Po1, 5
2	What is DBMS?	L1	CO1	PO 2
3	What is a Database system?	L1	CO1	PO1
4	What is the role of Database Administrator ?	L1	CO1	PO2
5	Disadvantage in File Processing System?	L2	CO1	PO2
6	What is a view? How it is related to data independence?	L2	CO1	PO6
7	What is Data Model?	L1	CO1	PO2
8	What is E-R model	L1	CO1	PO1
9	What is Relationship, Relationship set, and Relationship	L1	CO1	PO5

		type?			
10		What is the difference between the strong entity set and weak entity set	L2	CO 1	PO3
Part – B (Long Answer Questions)					
1	a)	What is DBMS? Write differences between File Processing System and a DBMS?	L4	CO1	PO1, 2
	b)	Explain the functions of Database Administrator?	L2	CO1	PO1, 5
12	a)	Explain Three Abstraction Levels in DBMS?	L2	CO1	PO1, 2
	b)	Explain various DDL and DML Commands?	L2	CO1	PO1,
13	a)	What is DBMS? What are goals of DBMS?	L1	CO1	PO5
	b)	How to represent the Strong Entity set and Weak Entity set in ER-Model? Explain with an Example?	L3	CO1	PO2
14	a)	Explain the following: i) Data Independence ii) View of Data iii) Advantages of DBMS?	L2	CO1	PO1,
	b)	What is data model? What are the different types of data models? Explain ER model and relation model briefly?	L4	CO1	PO1, 3
15	a)	Explain the Relational Database Architecture?	L2	CO1	PO4,
	b)	What is E-R model? Develop an E-R Diagram for any Banking Enterprise System?	L4	CO1	PO1 2,

UNIT–II

S.No		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		Define relational database query?	L4	CO 2	PO 1,2
2		State about SELECT operation in Relational algebra?	L3	CO 2	PO 1,5
3		State about PROJECT operation in Relational algebra?	L3	CO 2	PO 1,2
4		Discuss the use of rename operation?	L4	CO 2	PO 1,
5		Define Null Values.	L1	CO 2	PO 5
6		What is domain integrity? Give example.	L1	CO 2	PO 2
7		What are the Different Types of constraints?	L3	CO 2	PO 1,
8		Explain primary key and foreign key constraints?	L4	CO 2	PO 1,3
9		What is the difference between primary key and unique key?	L1	CO 2	PO 4,
10		Explain super key	L2	CO 2	PO 2,
Part – B (Long Answer Questions)					
11	a)	Explain Tuple relational calculus?	L3	CO 2	PO 5,

	b)	How to destroy and alter tables in a DBMS?	L3	CO 2	PO 3,
12	a)	Discuss in detail about the properties of relation algebra?	L3	CO 2	PO 1,2
	b)	How we can convert relationship sets with key constraints into tables? Explain?	L4	CO 2	PO 3,2
13	a)	Discuss the importance of entity integrity and referential integrity constraints?	L3	CO 2	PO 2,5
	b)	What is the usage of 'group by' and 'having' clauses in SQL?	L1	CO 2	PO 1,
14	a)	With suitable Examples Explain Selection, Union, Rename & Cartesian (Cross) Product operations in relational algebra?	L2	CO 2	PO 2,
	b)	Explain about domain relational calculus with example?	L4	CO 2	PO 5,
15	a)	Explain the fundamental operations in relational algebra with examples?	L1	CO 2	PO 2,
	b)	With a suitable Example Explain Intersection, Join, Division and Assignment operations in relational algebra?	L3	CO 2	PO 1,

UNIT–III

S.No		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		Define redundancy?	L1	CO 3	PO 5,
2		Discuss normalization?	L3	CO 3	PO 1,
3		List the aggregate functions supported by SQL?	L2	CO 3	PO 5,8
4		List the table modification commands in SQL?	L2	CO 3	PO 5,6
5		List the set operations of SQL?	L2	CO 3	PO 1,2
6		What is the use of group by clause?	L1	CO 3	PO 2,5 ,
7		List out the Problems related to decompositions?	L2	CO 3	PO 1
8		Explain about multi-valued dependencies?	L2	CO 3	PO 4
9		Define First Normal Form?	L1	CO 3	PO 3
10		Explain about Loss less-join dependency?	L2	CO 3	PO 1
Part – B (Long Answer Questions)					
11	a)	Elaborate Normalization? Explain INF, 2NF, 4NF and 5NF with an Examples?	L2	CO 3	PO 1
	b)	What is functional dependency? Explain its types in detail?	L2	CO 2	PO 5
12	a)	Explain insertion, deletion, and modification anomalies?	L2	CO	PO

				3	2
	b)	What is trigger? Explain how to implement triggers in SQL?	L2	CO 3	PO 1
13	a)	What are the conditions to be followed to convert a relation in 3NF to BCNF?	L1	CO 3	PO 1,5
	b)	Given a relation R (X, Y, Z) and Functional Dependency set FD = {XY → Z and Z → Y}, determine whether the given R is in BCNF? If not convert it into BCNF.	L4	CO 3	PO 5
14	a)	Determine whether the decomposition of R into R1 (A , B) , R2 (B , C) and R3 (B , D) is lossless or lossy	L4	CO 3	PO 2
	b)	Explain the following operators in SQL With Examples: i) INTERSECT ii) EXCEPT iii) UNION iv) SOME	L2	CO 3	PO 1,2
15	a)	When is a decomposition said to be dependency preserving? Why this property Useful? Explain?	L3	CO 3	PO 1,2
	b)	What aggregate operators does SQL support? Explain with an Examples?	L2	CO 3	PO 1

UNIT–IV

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	Define a Transaction? List the properties of transaction	L2	CO 4	PO 1,5
2	Discuss different phases of transaction?	L1	CO 4	PO 1,4
3	Discuss recoverable schedules?	L2	CO 4	PO 2,3
4	Discuss cascade less schedules?	L2	CO 4	PO 3,6
5	Define Two Phase Commit protocol?	L2	CO 4	PO 1,
6	Demonstrate the implementation of Isolation	L3	CO 4	PO 2
7	Discuss the Procedure to test Serializability?	L2	CO 4	PO 2
8	Explain about different types of locks?	L2	CO 4	PO 1
9	Explain about transition states?	L2	CO 4	PO 1
10	Explain about acid properties?	L2	CO 4	PO 1
Part – B (Long Answer Questions)				
11 a)	Write about the transaction management with SQL using commit, rollback and save point.	L2	CO 4	PO 1
b)	Write and explain the time stamped and optimistic concurrency control?	L3	CO 4	PO 1,2
12 a)	What is Recover ability? Discuss types of recoverable schedules?	L2	CO 4	PO 1,3

	b)	Explain multiple granularities of locking protocol with an example?	L2	CO 4	PO 4
13	a)	Explain the Time Stamp- Based Concurrency Control protocol? How is it is used to ensure serializability?	L2	CO 4	PO 2
	b)	Explain the check point log-based recovery scheme for recovering the database?	L2	CO 4	PO 3
14	a)	What is ARIES (Algorithm for Recovery and Isolation Exploiting Semantics) in crash recovery? Describe the steps in crash recovery in ARIES?	L3	CO 4	PO 5,6
	b)	What is 2 phase locking protocol? How does it guarantee serializability?	L3	CO 4	PO 1
15	a)	How to test serializability of a schedule? Explain with an Example?	L3	CO 4	PO 6,12
	b)	Explain the following: (i)Serializability? (ii)Validation Protocol? (iii)Transaction Properties?	L2	CO 4	PO 2,5

UNIT–V

S.No		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		Discuss about data on External storage?	L3	CO 5	PO 1,6
2		Explain Clustered Indexes?	L2	CO 5	PO 2,5
3		Discuss the Primary and Secondary indexes?	L3	CO 5	PO 2,5
4		Define Tree Indexing?	L1	CO 5	PO 1,5
5		Explain Hash based Indexing?	L2	CO 5	PO 1,5
6		Discuss the intuition for Tree Indexes?	L2	CO 5	PO 2
7		Define Indexed Sequential Access Method?	L1	CO 5	PO 5
8		Discuss the Cost model of Heap files?	L3	CO 5	PO 6
9		Explain about B+ tree index file?	L2	CO 5	PO 2
10		Explain about static hashing?	L2	CO 5	PO 2
Part – B (Long Answer Questions)					
11	a)	Describe the Insertion, Deletion and Search Operations in B+ Trees?	L3	CO 5	PO 1
	b)	By considering an example, show how to reduce access time with primary index.	L5	CO 5	PO 1
12	a)	Explain Deletion and Insertion operations in ISAM with example and write the Pros and Cons of ISAM (Indexed	L2	CO 5	PO 2

		Sequential Access Method)?			
	b)	Compare heap file organization with hash file organization?	L3	CO 5	PO 1
13	a)	Is disk cylinder a logical concept? Justify your answer?	L4	CO 5	PO 1,2
	b)	State and explain various file organization methods? Give suitable example to each of them?	L3	CO 5	PO 2
14	a)	Give a brief note on Indexed Sequential Access Methods?	L3	CO 5	PO 5
	b)	Demonstrate bulk loading of B+ tree of order 3 with the following data (key*), 56*,32*,18*,72*,45*,16*,98*,83*,81*,27*,39*51*,66*,44*,33*,22*.	L4	CO 5	PO 1,5
15	a)	Is B+ Tree a multi-level indexing? How does it differ from B-Tree?	L3	CO 5	PO 1,2
	b)	What is mean by extendable hashing? Explain briefly with example.	L2	CO 5	PO 1,2

* **Blooms Taxonomy Level (BT)** (L1 – Remembering; L2 – Understanding; L3 – Applying; L4 – Analyzing; L5 – Evaluating; L6 – Creating)

Course Outcomes (CO)

Program Outcomes (PO)

CY3103PC: Hall Ticket No.: | | | | | | | | | | |

NARSIMHA REDDY ENGINEERING COLLEGE

MODEL QUESTION PAPER

(UGC AUTONOMOUS)

III B.Tech I Semester (NR20) Regular Examination, January 2023

DATABASE MANGEMENT SYSTEM

(Computer Science & Engineering (CS)

Time :3 hours **Maximum marks: 75**

Note:
- This question paper contains two parts A and B
- Part A is compulsory which carries 25 marks (1st 5 sub questions are one from each unit carry 2 Marks each & Next 5 sub questions are one from each unit carry 3 Marks). Answer all questions in Part A
- Part B Consists of 5 Units. Answer any one full question from each unit. Each

Part-A **(25 Marks)**

Answer all questions

Q.No		Question	M	CO	BL	PO
1)	a.	What is database?	2	L1	CO1	Po1, 5
	b.	What is Relationship, Relationship set, and Relationship type?	2	L1	CO1	PO5
	c.	Define relational database query?	2	L4	CO2	PO1, 2
	d.	Discuss the use of rename operation?	2	L4	CO2	PO1,
	e.	Define redundancy?	2	L1	CO3	PO5,
	f.	What is the use of group by clause?	3	L1	CO3	PO2, 5,
	g.	Discuss different phases of transaction?	3	L1	CO4	PO1, 4
	h.	Discuss recoverable schedules?	3	L2	CO4	PO2, 3
	i.	Discuss cascade less schedules?	3	L2	CO4	PO3, 6

	j.	Define Two Phase Commit protocol?	3	L2	CO4	PO1,

Part-B **(50 Marks)**

Answer any five questions
All Questions carry equal Marks

Q.No		Question	M	CO	BL	PO
UNIT–I						
2)	a.	What is DBMS? Write differences between File Processing System and a DBMS?	5	L4	CO1	PO1, 2
	b.	Explain the functions of Database Administrator?	5	L2	CO1	PO1, 5
OR						
3)	a.	Explain the Relational Database Architecture?	5	L2	CO1	PO4,
	b.	What is E-R model? Develop an E-R Diagram for any Banking Enterprise System?	5	L4	CO1	PO1 2,
UNIT–II						
4)	a.	Discuss the importance of entity integrity and referential integrity constraints?	5	L3	CO2	PO2, 5
	b.	What is the usage of 'group by' and 'having' clauses in SQL?	5	L1	CO2	PO1,
OR						
5)	a.	Explain Tuple relational calculus?	5	L3	CO2	PO5,
	b.	How to destroy and alter tables in a DBMS?	5	L3	CO2	PO3,
UNIT–III						
6)	a.	Explain insertion, deletion, and modification anomalies?	5	L2	CO3	PO2
	b.	What is trigger? Explain how to implement triggers in SQL?	5	L2	CO3	PO1
OR						
7)	a.	Elaborate Normalization? Explain INF, 2NF, 4NF and 5NF with an Examples?	5	L2	CO3	PO1
	b.	What is functional dependency? Explain its types in detail?	5	L2	CO2	PO5

UNIT–IV						
8)	a.	Write about the transaction management with SQL using commit, rollback and save point.	5	L2	CO4	PO1
	b.	Write and explain the time stamped and optimistic concurrency control?	5	L3	CO4	PO1, 2
OR						
9)	a.	Explain the Time Stamp- Based Concurrency Control protocol? How is it is used to ensure serializability?	5	L2	CO4	PO2
	b.	Explain the check point log-based recovery scheme for recovering the database?	5	L2	CO4	PO3
UNIT–V						
10)	a.	Describe the Insertion, Deletion and Search Operations in B+ Trees?	5	L3	CO5	PO1
	b.	By considering an example, show how to reduce access time with primary index.	5	L5	CO5	PO1
OR						
11)	a.	Explain Deletion and Insertion operations in ISAM with example and write the Pros and Cons of ISAM (Indexed Sequential Access Method)?	5	L2	CO5	PO2
	b.	Compare heap file organization with hash file organization?	5	L3	CO5	PO1

M – Marks **CO –** Course Outcomes **PO –** Program Outcomes

BL – Bloom's Taxonomy Levels (**L1–**Remembering, **L2–**Understanding, **L3–**Applying,**L4–**Analyzing, **L5–** Evaluating, **L6–**Creating)