Reg. No. ☐☐☐☐☐☐☐☐☐☐☐☐☐

B.E / B.TECH. DEGREE EXAMINATION, MAY 2023

III Semester

CS18302 –DATABASE MANAGEMENT SYSTEMS

(Computer Science and Engineering)

(Regulation 2018A)

TIME: 3 HOURS   **MAX. MARKS: 100**

CO 1 Student can able to develop database schema models and database development process with various constraints.

CO 2 Student can design database using E-R modeling and apply normalization techniques over the raw data.

CO 3 Student will be able to manage the transactions that happens in a database

CO 4 Student can able to analyze the storage mechanism and recovery techniques of database system for suitable application.

CO 5 Student built the skill on various databases and able to design and implement the real world applications.

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	List the database applications?	1	1
2.	Define instance and schema?	1	1
3.	What is meant by dependency preserving decomposition?	2	2
4.	Differentiate between specialization and generalization with an example.	2	2
5.	Define a Transaction. List the properties of transaction	3	1
6.	Describe Timestamp based locking protocols.	3	1
7.	What are the advantages and disadvantages of indexed sequential files?	4	2
8.	Define Extendible Hashing	4	2
9.	Define XML schema.	5	1
10.	List the properties of NoSQL.	5	2

PART- B (5 x 14 = 70 Marks)

				Marks	CO	RBT LEVEL
11. (a)	(i)	Illustrate the various functional components of DBMS architecture with the help of a suitable diagram.		(10)	1	3
	(ii)	Define a nested query? Write a nested query to find the names of sailors who have reserved both a red and green boat.		(4)	1	3

(OR)

				Marks	CO	RBT LEVEL
(b)	(i)	Consider the following relational schema Employee (empno, name, age) Books (isbn, title, authors, publisher) Loan (empno, isbn, date). Write the following queries in relational algebra.		(8)	1	3

   a. Find the names of employees who have borrowed a book Published by McGraw-Hill?

   b. Find the names of employees who have borrowed all books Published by McGraw-Hill?

   c. Find the names of employees who have borrowed more than five different books published by McGraw-Hill?

   d. For each publisher, find the names of employees who have borrowed?

				Marks	CO	RBT LEVEL
	(ii)	Differentiate Embedded SQL and Dynamic SQL.		(6)	1	3

			Marks	CO	RBT LEVEL
12. (a)	Construct an ER-diagram for hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.		(14)	2	4

(OR)

			Marks	CO	RBT LEVEL
(b)	With suitable examples explain the various types of Normalization.		(14)	2	4

			Marks	CO	RBT LEVEL
13. (a)	Illustrate the two-phase locking protocol with an example.		(14)	3	3

(OR)

			Marks	CO	RBT LEVEL
(b)	Consider the following transactions with data items P and Q initialized to zero: T1: read(P);		(14)	3	3

read(Q);
If P=0 then Q:=Q+1;
write(Q);
T2: read(Q);
read(P);

If Q=0 then P:=P+1;

write(P);

Solve and find any non-serial interleaving of T1 and T2 for concurrent execution leads to a serializable schedule or non-serializable schedule. Explain?

14. (a)	What is RAID? Describe the different levels in RAID technology and explain its features.		**(14)**	4	3
	(OR)				
(b)	Illustrate insertion and deletion of an element in B+ trees with an example.		**(14)**	4	3
15. (a)	Describe in detail about Data warehousing & Data Mining.		**(14)**	5	4
	(OR)				
(b)	Describe in detail about Mobile and Multimedia database.		**(14)**	5	4

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	**CO**	**RBT LEVEL**
16.	List the steps involved in query processing. How will you estimate the query cost for selection operation.	**(10)**	4	5