USN: | | | | | | | | | | |

B.N.M. Institute of Technology

An Autonomous Institution under VTU

Semester End Assessment, September 2023

Fourth Semester BE, 2021-22 Scheme

Database Management System-21CSE143

Duration: 3 Hours **Max. Marks: 100**

Note: 1. Answer one full question from each Module (5Q x 20M=100 Marks)

Module 1					
Q. No	**Questions**	**Marks**	**CO**	**PO**	**Cognitive Level**
1 (a)	Construct an ER Diagram for Order Database considering the orders, customers and salesman as entities having suitable attributes.	6	1	1,2,3,12/1	Apply
1 (b)	Identify the possible constraints in Relational DBMS along with the effects of their violations.	6	1	1,2,3,12/1	Apply
1 (c)	Apply the suitable operators of relational Algebra to answer the following queries by considering the following schema: *Supplier (Sid, Sname, city)* *Parts (Pid, Pname, colort)* *Catalog (sid, pid, cost)* *i. Find the names of suppliers who supply some red parts* *ii. Find the Sids of suppliers who supply some red or green parts* *iii. Find the Sids of suppliers who supply every parts* iv. *Find the Sids of suppliers who supply every red part*	8	1	1,2,3,12/1	Apply
OR					
2 (a)	Build the relational algebra expression for the following queries using given schema: *SAILORS (Sid, Sname, rating, age)* *BOATS (bid, bname, color)* *RESERVES (Sid, bid, day)* a) Find the names of sailors who have reserved green boat. b) Find the names of sailors who have reserved all boats. Find the names of sailors who have reserved boat with B_id= 103	6	1	1,2,3,12/1	Apply
2 (b)	Make use of the following Join operations and emphasize their working by choosing a suitable relational database. a) Theta Join b) Equi Join	8	1	1,2,3,12/1	Apply

2 (c)	Identify the various types of attributes and entities utilized to build relational database.	6	1	1,2,3,12/1	Apply
	Module 2				
3 (a)	Apply the following concepts of PL-SQL to demonstrate their usage. a) Views b) Procedures	08	2	1,2,3,4,5,12/1	Apply
3 (b)	Consider the schema for Movie Database and Apply the concepts of SQL to solve queries *ACTOR (Act_id, Act_Name, Act_Gender)* *DIRECTOR (Dir_id, Dir_Name, Dir_Phone)* *MOVIES (Mov_id, Title, Year, Dir_id)* *MOVIE_CAST (Act_id, Mov_id, Role)* *RATING (Mov_id, Rev_Stars)* a) List all actors who acted in a movie before 2015 and also in a movie after 2020 b) Find the title of movies and number of stars for each movie. Sort the result by movie title. c) Update rating of all movies directed by 'Yash Chopra' to 5. Using view display all the details of all the movies in the database.	12	2	1,2,3,4,5,12/1	Apply
	OR				
4 (a)	Utilize the following aggregate functions and demonstrate their usage in SQL: a) Count b) Max c) Avg d) Sum	08	2	1,2,3,4,5,12/1	Apply
4 (b)	Apply the concepts of SQL to solve queries *SALESMAN (S_id, Name, City)* *CUSTOMER (C_id, C_Name, City, Grade, S_id)* *ORDERS (Ord_No, Ord_Amt, O_Date, C_id, S_id)* a) Count the customers with grades above Bangalore's average. b) Find the name and numbers of all salesmen who had more than one customer. c) List all salesmen and indicate those who have and don't have customers in their cities Find the salesman who has the customer with the highest amount order.	12	2	1,2,3,4,5,12/1	Apply
	Module 3				
5 (a)	Analyze the need for normalization in DBMS. Outline 2NF and 3NF with examples.	10	3	1,2,5,12/1	Analyze
5 (b)	Examine given set of functional dependencies and construct minimal cover a) E: {AB→D, B→ C, AE→B, A→D, D → EF} F: {A → BC, B →C, A→B, AB →C}	10	3	1,2,5,12/1	Analyze
	OR				

6 (a)	Inspect whether the given decompositions are lossless or lossy by Considering the given relations and their decompositions. a) R = {A, B, C, D, E} which is decomposed into R1 = {A, B, C}, R2 = {C, D, E} with FD = {A → BC, CD → E, B → D, E → A}. b) R = {V, W, X, Y, Z} which is decomposed into R1= {V, W, X}, R2= {X, Y, Z} With FD= {Z→Y, Y→Z, X→YV, VW→X}	10	3	1,2,5,12/1	Analyze
6 (b)	Analyze the need for normalization in DBMS. Outline the first four normal forms with examples.	10	3	1,2,5,12/1	Analyze
Module 4					
7 (a)	Identify the benefits of hashing in improving the efficiency of database. Illustrate it in detail.	10	4	3, 12/1	Apply
7 (b)	Build a B+ tree and identify its advantages in effective database manipulation.	10	4	3, 12/1	Apply
OR					
8 (a)	Make use of the 3-schema architecture to show how the data independence is achieved in DBMS.	10	4	3, 12/1	Apply
8 (b)	Identify the various types of Indexing techniques that helps to fasten up the data access.	10	4	3, 12/1	Apply
Module 5					
9 (a)	Compare the features of SQL with No-SQL. Infer the advantages of No SQL in managing the unstructured data.	10	5	1,2,3,4,12/1	Analyze
9 (b)	Utilize the ACID properties to emphasize the stability of DBMS.	10	5	1,2,3,4,12/1	Analyze
OR					
10(a)	Analyze how the following concepts of concurrency control in DBMS hinders to develop the reliable database systems. a. Dirty Read b. Lost Update c. Non repeatable read	10	5	1,2,3,4,12/1	Analyze
10(b)	Analyze how the 2-phase locking protocol can be utilized for achieving concurrency control in in DBMS. Mention its limitations and examine how strict 2PL can address the issues.	10	5	1,2,3,4,12/1	Analyze