P P SAVANI UNIVERSITY

Third Semester of B. Tech. Examination

December 2022

SECE2111 Database Management System

26.11.2022, Saturday **Time: 10:00 a.m. To 12:30 p.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1	Answer the Following: (MCQ/Short Question/Fill in the Blanks)(Any five)	**[05]**	**CO**	**BTL**
(i)	What do you mean by instances and schemas?		1	1
(ii)	Which command is used to change the name of table?		1	2
(iii)	State True or False: SELECT DISTINCT statement is used to return only distinct values.		1	2
(iv)	New column can be added to the existing table using _____ SQL command.		2	1
(v)	The number of tuples in a relation is known as (a) degree (b) relation (c) attribute (d) cardinality		2	1
(vi)	Given relations r(w, x) and s(y, z), the result of select distinct w, x from r, s is guaranteed to be same as r, provided (a) r has no duplicates and s is non-empty (b) r and s have no duplicates (c) s has no duplicates and r is non-empty (d) r and s have the same number of tuples		2	2
(vii)	Define Alternate key in the DBMS.		1	1
Q - 2 (a)	branch (branch_name, branch_city, assets) customer (customer_name, customer_street, customer_city) account (account_number, branch_name, balance) loan (loan_number, branch_name, amount) depositor (customer_name, account_number) borrower (customer_name, loan_number) Write relational algebra query for the following using above relations. a. Find the loan number for the loan with an amount greater than $1200. b. Find the names of all customers who have a loan more than $20000. c. Find the name and loan amount of all customers who have a loan at the bank. d. Find the names of all customers who have a loan at the Perryridge branch.	**[05]**	2	3
Q - 2 (b)	What is data abstraction? Also, explain various types of data independence.	**[05]**	2	2
	OR			
Q - 2 (b)	Differentiate between traditional database and RDBMS.	**[05]**	1	2
Q - 3 (a)	Give the usage of Aggregate Functions of SQL with suitable example.	**[05]**	1	1
Q - 3 (b)	Define: Primary Key, Foreign Key and NOT NULL constraint.	**[05]**	1	2
	OR			
Q - 3 (a)	Explain the various types of joins with example.	**[05]**	1	2
Q - 3 (b)	Give the difference between In, ALL and ANY in the subqueries.	**[05]**	3	3
Q - 4	Attempt any one.	**[05]**		

(i)	Justify the use of query optimization and explain its two forms (DBMS)? Give the suitable example.		3	4
(ii)	Discuss various steps of query processing with proper diagram.		3	4

SECTION – II

Q - 1	Answer the Following: (MCQ/Short Question/Fill in the Blanks)	[06]		
(i)	For R(A,B,C) with C as the key itself, How many maximum number of super keys are possible from R?		2	3
(ii)	For R (EnNo, Name, PhoneNo, BDate) and functional dependencies EnNo -> Name and PhoneNo -> BDate. If R is decomposed into R1(EnNo, Name) and R2(PhoneNo, BDate) it will be ... (a) Dependency preserving and loss less join (b) Loss less join but not dependency preserving (c) Dependency preserving but not loss less join (d) Not dependency preserving and not loss less join		2	2
(iii)	For R(L,M,N,O,P,Q,R) set of FD is {L->M, MN->O, P->N, O->L), which is valid candidate key set? (a) LE, ME, OE (b) LEQ, MEQ, OEQ (c) LEQR, MEOR, OEQR (d) LEQR, MEQR, OEQR		1	3
(iv)	For X != Y, if X= False and Y=True, Select the Y statement from the following: (a) A relation R is in 3NF if every non-prime attribute of R is completely functionally dependent on every key of R (b) Every relation in 3NF is also in BCNF (c) No relation can be in both 3NF and BCNF (d) Every relation in BCNF is also in 3NF		3	3
(v)	Which normalization form is based on the transitive dependency?		3	1
(vi)	Consider the following log sequence of two transactions on a bank account, with initial balance 12000, that transfer 2000 to a mortgage payment and then apply a 5% interest. 1. T1 start 2. T1 B old =12000 new =10000 3. T1 M old =0 new =2000 4. T1 commit 5. Checkpoint C1 created 6. T2 start 7. T2 B old =10000 new =10500 8. T2 commit Suppose the database system crashes just before log record 8 is written. When the system is restarted, which statement needs to be undo/redo?		4	4
Q - 2	Consider the database of an online bookstore. Every book has a title, isbn, year and price. The store also keeps the author and publisher for any book. For authors, the database keeps the name, address and the url of their homepage. For publishers, the database keeps the name, address, phone number and the url of their website. The store has several warehouses, each of which has a code, address and phone number. The warehouse stocks several books. A book may be stocked at multiple warehouses. The database records the number of copies of a book stocked at various warehouses. The bookstore keeps the name, address, email-id, and phone number of its customers. A customer owns several shopping basket. A shopping basket is identified by a basketID and contains several books. Some shopping baskets may contain more than one copy of same book. The database records the	[06]	4	3

	number of copies of each book in any shopping basket. Design an ER diagram for such a bookstore.			
Q - 3	For given relation R(A,B,C,D) with Functional Dependencies (FDs): {AB→C, AB→D, C→A, D→B}. Find all candidate key. Find non prime attribute. Find the relation R is in which normal form?	[06]	3	5
Q - 4	Attempt any two.	[06]		
(i)	What's PL/SQL? Briefly discuss advantages of PL/SQL.		2	1
(ii)	What is a transaction? Discuss its four important properties.		1	2
(iii)	Consider the following set of functional dependencies on the relation (ABC), with FDs: {A→B,AB→C,A→BC,B→C}. Find the canonical cover for the above FD set.		3	5
Q - 5	Attempt any one.	[06]		
(i)	What's View Serializability? Explain all conditions along with examples.		1	2
(ii)	What's Normalization? Discuss 3NF and BCNF with suitable examples.		3	2

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CO : Course Outcome Number BTL : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	**2: Understand**	**3: Apply**
4: Analyze	**5: Evaluate**	**6: Create**