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School of Engineering Sciences & Technology
New Delhi-110062
ODD Semester Examination-2024

Paper Name: Introduction to Database Management system **Paper Code: BCA 302 /BSC 302**

Time: 2.5 Hours

Maximum Marks: 60

Note: Mobile Phones or programmable calculator or any equipment with memory are not allowed inside the examination hall.

SECTION: A (20 Marks)

True or False

All questions are compulsory (20x1=20)

S.No	Questions	CO	BL
1.	DROP DATABASE my_database; this SQL command deletes the my database schema and all its contents.	CO1	L4
2.	SELECT * WHERE NAME = 'John' FROM EMPLOYEES; This SQL command retrieves all columns from the EMPLOYEES table where the NAME is 'John'.	CO2	L3
3.	INSERT INTO STUDENT VALUES (1, 'Alice', '2024-01-01'); This SQL command inserts a record into the STUDENT table with values 1, 'Alice', and '2024-01-01'.	CO1	L4
4.	DELETE FROM STUDENT; This SQL command updates all rows in the ORDERS table by setting the STATUS to 'Completed'.	CO1	L2
5.	GRANT SELECT, UPDATE TO USER 'john_doe';	CO1	L1
6.	This SQL command grants SELECT and UPDATE privileges to the user 'john_doe'.	CO3	L3
7.	RENAMES TABLE STUDENTS TO ALUMNI; This renames the table STUDENTS to ALUMNI.	CO1	L1
8.	INSERT INTO STUDENT (ID, NAME, AGE) VALUES (1, 'Alice', 20); This adds a record to the STUDENT table with the given values.	CO1	L2
9.	DELETE FROM EMPLOYEE WHERE SALARY < 30000; removes all records from the EMPLOYEE table where the salary is less than 30,000.	CO2	L1
10.	BEGIN TRANSACTION; This starts a new transaction in SQL.	CO3	L2
11.	COMMIT; saves all changes made in the current transaction.	CO4	L1
12.	ROLLBACK; undoes all changes made in the current transaction.	CO3	L2
13.	OTP stands for Online transactional processing	CO4	L3
14.	GRANT ALL PRIVILEGES ON DATABASE school TO admin; grants all permissions on the school database to admin.	CO3	L1
15.	UPDATE STUDENT SET AGE = 21 WHERE ID = 1; This updates the AGE of the student with ID = 1 to 21.	CO1	L3
16.	DBA stands for Database Administrator	CO4	L1
17.	Two Phase locking protocol is NOT concurrency control techniques	CO2	L2
18.	Exclusive lock is denoted by X	CO4	L3
19.	Data Redundancy is an error in database	CO4	L1
20.	Oracle 13i is a version of oracle database	CO1	L1

SECTION-B (4x5=20 Marks)

Attempt any FOUR Questions.

1.	Explain the concept of Entity Relationship Model. Draw an ER Model for DOMINOS PIZZA an food ordering & delivery system	CO4	L2
2.	What are attributes in ER Model? Explain types of Attributes	CO3	L3

3.	Differentiate between STRONG entity and WEAK entity (7points)	CO2	L2																								
4.	What is Normalization? Explain 1 NF, 2NF and 3NF with the help of tables	CO4	L3																								
5.	Define Conflict Serializability. Check from a given schedule whether schedule is Conflict Serializable or NOT. <table><tr><td>T₁</td><td>T₂</td><td>T₃</td></tr><tr><td>R(X)</td><td></td><td></td></tr><tr><td></td><td></td><td>R(Y)</td></tr><tr><td></td><td></td><td>R(X)</td></tr><tr><td></td><td>R(Y)</td><td></td></tr><tr><td></td><td>R(Z)</td><td></td></tr><tr><td>W(Z)</td><td></td><td></td></tr><tr><td>W(Y)</td><td></td><td></td></tr></table>	T ₁	T ₂	T ₃	R(X)					R(Y)			R(X)		R(Y)			R(Z)		W(Z)			W(Y)			CO3	L5
T ₁	T ₂	T ₃																									
R(X)																											
		R(Y)																									
		R(X)																									
	R(Y)																										
	R(Z)																										
W(Z)																											
W(Y)																											
6.	Explain transaction life cycle and describe its phases in detail	CO2	L2																								

SECTION-C (2x10=20 Marks)

Attempt any TWO Questions.

1.	The following is the list of events in an inter-leaved execution of set T₁,T₂,T₃ ,T₄,T₅,T₆ and T₇ assuming 2PL. Is there a deadlock? If 'yes' which transactions are involved in deadlock? <table><tr><th>Time</th><th>Transaction</th><th>Code</th></tr><tr><td>t₁</td><td>T₂</td><td>Lock(A,X)</td></tr><tr><td>t₂</td><td>T₁</td><td>Lock(C,S)</td></tr><tr><td>t₃</td><td>T₃</td><td>Lock(B,S)</td></tr><tr><td>t₄</td><td>T₅</td><td>Lock(A,S)</td></tr><tr><td>t₅</td><td>T₄</td><td>Lock(E,S)</td></tr><tr><td>T₆</td><td>T₆</td><td>Lock(D,X)</td></tr></table>	Time	Transaction	Code	t ₁	T ₂	Lock(A,X)	t ₂	T ₁	Lock(C,S)	t ₃	T ₃	Lock(B,S)	t ₄	T ₅	Lock(A,S)	t ₅	T ₄	Lock(E,S)	T ₆	T ₆	Lock(D,X)	CO4	L4				
Time	Transaction	Code																										
t ₁	T ₂	Lock(A,X)																										
t ₂	T ₁	Lock(C,S)																										
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T ₆	T ₆	Lock(D,X)																										
2.	Explain the concept of View Serializability with tables	CO3	L3																									
3.	Consider the table and answer the following questions (Table - Student) <table><tr><th>Employee_ID</th><th>Employee_Name</th><th>Designation</th><th>Department</th><th>City</th></tr><tr><td>101</td><td>Alice Johnson</td><td>Software Engineer</td><td>IT</td><td>Seattle</td></tr><tr><td>102</td><td>Bob Brown</td><td>Data Analyst</td><td>Analytics</td><td>New York</td></tr><tr><td>103</td><td>Charlie Smith</td><td>Project Manager</td><td>Management</td><td>Chicago</td></tr><tr><td>104</td><td>Diana Jones</td><td>Software Engineer</td><td>IT</td><td>Los Angeles</td></tr></table> - Write an SQL query to display names of Employees ending with 'son' and 'th'. - Write an SQL query to fetch the Designation from the Employee table. - Write an SQL query to display names of Employees starting with 'Al' and 'Bo'. - Write an SQL query to display the City 'Seattle' and the Department 'IT' from the Employee table. - Display all records of employees whose Employee_ID is ODD	Employee_ID	Employee_Name	Designation	Department	City	101	Alice Johnson	Software Engineer	IT	Seattle	102	Bob Brown	Data Analyst	Analytics	New York	103	Charlie Smith	Project Manager	Management	Chicago	104	Diana Jones	Software Engineer	IT	Los Angeles	CO3	L5
Employee_ID	Employee_Name	Designation	Department	City																								
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4.	What is Relational Algebra in RDBMS? Explain all functions of relational algebra	CO2	L1																									

BL- Bloom's Taxonomy Levels (1-Remembering, 2-Understanding, 3-Applying, 4-Analysing, 5- Evaluating, 6-Creating)