University of Mumbai

Examination Second Half 2021

Sample Paper

Examinations Commencing from 22nd November 2021 to 5thJanuary 2022

Program: **Electronics and Computer Science**

Curriculum Scheme: Rev2019

Examination: SE Semester: III

Course Code: ECC 305 and Course Name: Database Management Systems

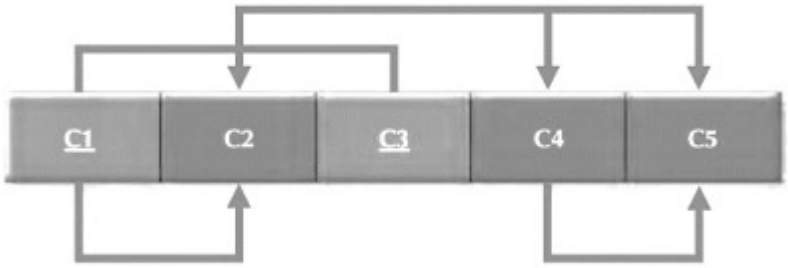
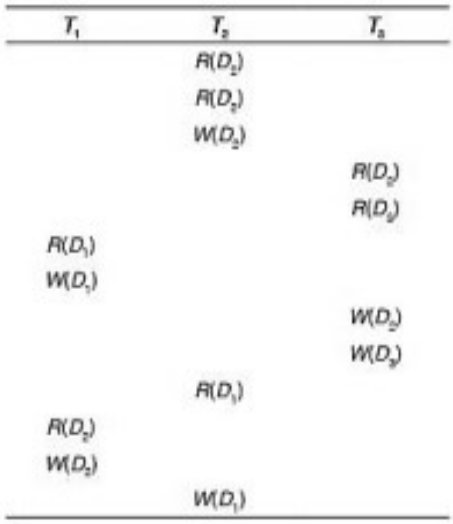
Time: 2hour 30 minutes Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Duplication of data at several places is called as _____
Option A:	Data Isolation
Option B:	Atomicity Problem
Option C:	Data Inconsistency
Option D:	Data Redundancy
2.	(Select course id from section where semester = 'Fall' and year= 2009) except (select course id from section where semester = 'Spring' and year= 2010); This query will display:
Option A:	Only tuples from second part
Option B:	Tuples from both the parts
Option C:	Tuples from first part which do not have second part
Option D:	Only tuples from the first part which has the tuples from second par
3.	Subset of Super keys is known as
Option A:	Candidate key
Option B:	Non Key Attribute
Option C:	Non Primary Attribute
Option D:	Foreign key
4.	Which one of the following is conflict operation?
Option A:	Reads and writes from the same transaction
Option B:	Reads and writes from different transaction
Option C:	Reads and writes from different transactions on different data items
Option D:	Reads and writes from different transaction on same data
5.	What is the purpose of physical data independence?
Option A:	The user of the logical level does not need to be aware of the complexity of physical level.
Option B:	The user of the logical level must know about physical level.
Option C:	Complexity issue at logical level is not known.
Option D:	The interdependence of logical and data.
6.	The three basic techniques to control deadlocks are: deadlock ____, deadlock

	detection, and deadlock avoidance.
Option A:	Prevention
Option B:	Protection
Option C:	Commit
Option D:	Recovery
7.	In E-R model, the details of the entities are hidden from the user. This process is called
Option A:	Categorization
Option B:	Abstraction
Option C:	Generalization
Option D:	Specialization
8.	'_ _ _%' matches any string of
Option A:	At least three characters
Option B:	At most three characters
Option C:	Exactly three characters
Option D:	Exactly three characters ending with %
9.	Relation dept year(dept name, total inst 2007, total inst 2008, total inst 2009). Here the only functional dependencies are from dept name to the other attributes. The highest form of normalization for the above information is:
Option A:	1NF
Option B:	2NF
Option C:	BCNF
Option D:	3NF
10.	The correct order of SQL expression is
Option A:	Select, group by, where, having
Option B:	Select, where, group by, having
Option C:	Select, group by, having, where
Option D:	Select, having, where, group by

Q2	Solve any Two Questions out of Three 10 marks each
A	Discuss different types of database architectures with the help of a neat diagram of each type. Explain one application of each type of architecture
B	Design a database for a worldwide package delivery company (e.g., DHL or FedEx). The database must be able to keep track of customers who ship items and customers who receive items; some customers may do both. Each package must be identifiable and trackable, so the database must be able to store the location of the package and its history of locations. Locations include trucks, planes, airports, and warehouses Your design should include an E-R diagram, a set of relational schemas, and a list of constraints, including primary-key and foreign-key constraints.
C	Consider the following relational schema Product(Maker, model, type) PC(Model, speed, ram, harddrive, screen, price) Laptops(model, speed, ram, harddrive, screen, price) Printer(model, color, type, price) Write the queries for the following using relational algebra 1. Find the make and model of all the pcs that are less that $1000 but greater than $800 dollars? 2. What are the models of pcs that are not made by a company that also makes laptops? 3. Find those manufacturers (i.e., makers) who produce Laptops but not PC's. 4. Find the model and price of all products made by manufacturer B (i.e., maker='B') 5. List the price of all the PC, laptop, and printer.

Q3	Solve any Two Questions out of Three 10 marks each
A	Consider the schema of World War II capital ships Classes(class, type, country, numGuns, bore, displacement) Ships(name, class, launched) Battles(name, date) Outcomes(ship, battle, result) 5 | P a g e Ships are built in "classes" from the same design, and the class is usually named for the first ship of that class. The relation Classes records the name of the class, the type ('bb' for battleship or 'bc' for battlecruiser), the country that build the ship, the number of main guns, the bore (diameter of the gun), and the displacement (weight, in tons). Relation Ships records the name of the ship, the name of its class, and the year in which the ship was launched. Relation Battles gives the name and date of battles involving these ships, and relation Outcomes gives the result (sunk, damaged, or ok) for each in each battle. Write SQL queries for the following 1. Find the ships heavier than 35,000 tons 2. Find those battles with at least three ships of the same country 3. Find the countries whose ships had the largest number of guns. 4. Find the classes of ships, at least one of which was sunk in a battle 5. Find for each class the year in which the first ship of that class was launched

B	Consider the following dependency diagram of a database. The primary keys are underlined  a. Identify and discuss each of the indicated dependencies b. Convert the above database in 3NF. Explain your solution
C	Consider the three data items D1, D2 and D3 and the following execution of schedules of transactions T1, T2 and T3:  a. Find whether above schedule is conflict serializable or not b. Find whether the schedule has deadlock or not

Q4.	**Solve any Four out of Six5 marks each**
A	Explain roles and responsibilities of database administrator.
B	Explain transaction state diagram.
C	Explain total and partial participation.
D	Compare file system with database management system.
E	List relational algebra operators and give its examples.
F	Define normalization and explain how to remove insertion anomaly.