Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

I SEMESTER M.C.A.

END SEMESTER EXAMINATIONS, FEB 2021

SUBJECT: DATABASE MANAGEMENT SYSTEM [MCA 4151]

REVISED CREDIT SYSTEM
(24/02/2021)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A.	Explain the nested-loop and block nested-loop join algorithm along with its cost estimation.	5
1B.	Discuss the role of storage manager in the Database Management System environment.	3
1C.	Under what conditions can an attribute of a binary relationship type be migrated to become an attribute of one of the participating entity type?	2
2A.	Consider the following relations for a database that keeps track of automobile sales in a car dealership.(OPTION refers to some optional equipment installed on the automobile): CAR(Serial_no,Model, Manufacturer, Price) OPTION(Serial_no, Option_name, Price) SALE(Salesperson_id,Serial_no,Date,Sale_price) SALESPERSON(Salesperson_id,Name,Phone) For this schema: i. Specify the super keys, candidate keys and primary key ii. Specify the foreign keys iii. Draw the Schema Diagram	5
2B.	Discuss the process of updating the dense index file when the deletion operation is performed on a data file.	3
2C.	What is the significance of data independence concept in database system?	2
3A.	Describe the two alternatives for specifying structural constraints on relationship types in an Entity Relationship model.	5
3B.	Give the proof for the rules- Union, Decomposition & Pseudo-transitivity using Armstrong's axioms.	3
3C.	Test the following schedule for conflict serializability using precedence graph method.	2

	T1	T2	T3
1	Read(A)		
2		Read(B)	
3			Read(A)
4	Write(A)		
5			Write(C)
6		Read(A)	
7		Write(B)	
8			Read(D)
9			Write(D)
10	Write(C)		
11	Write(D)		
12		Read(B)	

4A.	Consider the following schema and write SQL queries- **Pizza_house** (HouseCode, StreetNo, City) **Pizza_flavours** (Itemcode, ItemName, Price) **Pizza_Flavours_Avaialble** (HouseCode, Itemcode) **Pizza_Cust** (Custid, CustName, Phone, StreetNo, City, Bonus_points) **Pizza_Order** (Orderid, Custid, Itemcode, Order_date, Qty, Amount) **i.** Find the HouseCodes at which pizza items with price more than 500 available. **ii.** Add 10 bonus points to the customers who placed order for amount more than 1000 during Jan-2019 to May-2019. **iii.** Find all the Pizza Houses and available Item Names in the location where customer with name 'Ajay' lives. **iv.** List the name of customers who have placed highest total ordered amount during month of February 2021. **v.** Find the Item names for which total sales quantity is more than 1000 during the year 2018.	**5**
4B.	Describe the scheme for the automatic acquisition of locks whenever concurrent **read ()**, **write ()** operations are performed on the data items.	**3**
4C.	Write the 3NF decomposition algorithm.	**2**
5A.	Consider the relational schema R (A, B, C, D, E, G) and functional dependency set *F*. *F*= {AC→G, D→EG, CG→BD, CE→B, D→G}. Find the cannonical cover.(show detailed steps for at least one Left extraneous and Right extraneous attribute)	**5**
5B.	Write a trigger *Trg_Discount* (refer schema given in **Q.4A.**) to be fired whenever an order record is inserted into Pizza_Order table. The trigger should update the bonus points and display the discount amount eligible for. Calculate the discount depending on the total bonus points (bonus points gained so far + bonus points gained via the current order). One Bonus point is awarded for every 100/- of the order amount placed. The discount is calculated as per the following criteria- 10% discount if total bonus points 50 to 100 and 15% discount if Total bonus points is more than 100 and no discount if total bonus points is less than 50.	**3**
5C.	Describe ACID properties of a transaction.	**2**

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