Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Unit of MAHE, Manipal

FOURTH SEMESTER B.TECH. (COMPUTER AND COMMUNICATION ENGINEERING)

ONLINE GRADE IMPROVEMENT / MAKE-UP EXAMINATIONS, AUG 2021

SUBJECT: DATABASE SYSTEMS [ICT 2271]

(REVISED CREDIT SYSTEM)
(06/08/2021)

TIME: 2 HOURS **MAX. MARKS: 40**

Instructions to candidates:

- Answer **ANY 4 FULL** questions.
- Missing data, if any, may be suitably assumed.

1A. What are the advantages of using a database approach? Explain with suitable example **5**

1B. With a neat diagram, explain the three schema architecture. **5**

2A. Consider the schema given in Figure Q.2A

CUSTOMER(cust#: int, cname:string, city:string)
ORDERS(order#:int, odate:date, cust#:int, ordamt: int)
ORDER_ITEM(order#:int, item#: int, qty: int)
ITEM(item#: int, unitprice: int)
SHIPMENT(order#: int, warehouse#: int, shipdate: date)
WAREHOUSE(warehouse#: int, shipdate: date)

Figure Q.2A

Write the SQL query to perform the following:

i. Print the order information (along with its customer information), which has at least two items each with quantity > 50.

ii. List the order number for the orders that were shipped from all the warehouses that the company has in a specific city.

iii. Display all those items which have not been bought by any customer

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2B. Describe the following:

i. Different types of constraints which can be applied on table in database.

ii. Problem of spurious tuples and how it can be prevented.

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3A. Consider the scheme given in Figure Q.3A.

Instructor (I_Id, Name, I_Department);
Course(C_ID, Title, C_Department);
Teaches(I_ID, C_ID)

Figure Q.3A

i. List the names of faculty of ICT department who teach all courses offered by CSE department.

ii. For each department, display the instructor name(s) who is/are paid with highest salary within their department.

6

3B. What do you mean by Minimal cover set? Give the algorithm to find Minimal cover F for a Functional dependency set E. Find the minimal cover of the following functional dependencies: $\{AB \rightarrow CD, BC \rightarrow D\}$ **4**

4A. For the schema given in Figure Q.4A write the following

Employee(Empid, Ename, Deptid, Salary, Hiredate, Jobid)
Department(Deptid, Deptname, Location)

Figure Q.4A

i. Write a procedure to display employee names and department id's in which they are working who are hired on a specified date, if that department has more than 2 locations.

ii. Write a trigger to satisfy the condition in employee table that the new salary of the employee should be always greater than old salary

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4B. What are the different types of transaction failures? Explain in detail with suitable examples. **4**

5A. Write an algorithm for testing Non-additive join property of decomposition. Suppose that relation R(A,B,C,D,E) is decomposed into R1 (A, B, C) and R2(A, D, E). Find whether this decomposition is lossless or lossy decomposition if the following set of functional dependencies hold, F(A→BC; CD→E; B→D; E→A). **5**

5B. What do you mean by schedule is view equivalent? Explain. Check the schedules given in Figure Q.5B and determine whether they are View Serializable or Conflict Serializable or both. Justify the answer.

T_1	T_2
read(A)	
write(A)	
	read(A)
	write(A)
read(B)	
write(B)	
	read(B)
	write(B)

Schedule 1

T_1	T_2
read(A)	
write(A)	
read(B)	
write(B)	
	read(A)
	write(A)
	read(B)
	write(B)

Schedule 2

Figure Q.5B

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6A. Consider a system which stores the information about the books. Each book maintained under this system has an ISBN, title, price and year information. The book is published by particular publisher. The system stores URL, phone, address and name of the publisher. System also stores information about the author such as name, address and url. Author can write any number of books. System maintains customer information along with book information they have purchased. Customer information like email-id, name, address and phone are stored. System has few warehouses to stock books. Warehouse has information like code, address, and phone. Each warehouse can store few copies of the book.

Draw an ER-Diagram describing the above scenario. Reduce the diagram and mention in which normal form the database is. **6**

6B. What are the locking operations in Shared/Exclusive mode? Write the suitable codes for all of them **4**

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