23MCA1030
Vinayak Singh

Reg. No.:

Name :

VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test II – October 2023

Programme	**: Master of Computer Applications**	**Semester**	**: Fall Semester 2023-2024**
		Code	**: PMCA503L**
Course Title	**: Database Systems**	**Slot**	**: C1+TC1**
Faculty	**: Dr.M.Sandhya**	**Class Nbr**	**: CH2023240101715**
Time	**: 1 ½ Hours**	**Max. Marks**	**: 50**

Answer ALL Questions

Q.No	Question Description	Marks

1. Consider the bank database given below:
branch(branch name, branch city, assets)
customer (ID, customer name, customer street, customer city)
loan (loan number, branch name, amount)
borrower (ID, loan number)
account (account number, branch name, balance)
depositor (ID, account number)
Give an expression in the relational algebra for each of the following queries:
a. Find the name of each branch located in "NewDelhi".
b. Find the ID of each borrower who has a loan in branch "Mumbai".
c. Find the name of customers who are having loan above Rs.10,00,000.
d. Find the name of the branch that is having maximum customers.
e. Find the list the customers who are having account in more than one branch. **10**

2. From the given set of functional dependencies AB → C, B→CD,C → D, D → A, E→BC, F→DE, compute the closure of the following with the detailed steps.
   a. $(ABD)^+$
   b. $(BCDE)^+$ **10**

3. Consider the given table below and normalize it upto 3rd normal form.

Trans_ID	Cust_ID	Seller_ID	Product_Name	Cost
1	10001	201, 301, 302	Fossil	15000
2	10002	203, 402	Tommy Hilfiger	20000
3	10003	202	Titan	5000
4	10004	201	Michael Kors	25000

FD : Product_Name → Trans_ID
Cost → Trans_ID **10**

Trans_ID → Cust_ID, Seller_ ID

4. Given a relation SE (year, month, day, shares traded, Amount volume) with trading data from the Stock Exchange.
   a. Write a PL/SQL program to list each trading day in order of number of shares traded, and show each day's rank. (5 marks)
   b. Write a PL/SQL program to generate a report showing the number of shares traded, number of trades, and total amount volume broken down by year, each month of each year, and each trading day. (5marks) **10**

5. Construct a B+ tree for (1, 4, 7, 10, 17, 21, 31, 25, 19, 20, 28, 42) with n=4. Illustrate it with a suitable diagram to show step wise insertion. **10**

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