VIT®

BHOPAL

www.vitbhopal.ac.in

MID TERM EXAMINATIONS – November 2024

Programme	: B.Tech.	Semester	: Interim Semester 2024-25
Course Title	: Database Management Systems	Course Code	: CSE3001
Date/Session	: 9 Nov 2024/Session I	Slot	: A21+A22+A23
Time	: 1 ½ hours	Max. Marks	: 50

Answer all the Questions

Q. No.	Sub. Sec.	Question Description	Marks
1		Describe the overall component architecture of DBMS. How does it lead to data independence?	10
2		Illustrate major components of an ER diagram. Design an ER diagram for HR management system with assuming suitable data.	10
3	(a)	Explain relational algebra operators. Consider following relational database and write relation algebra expression for the following-	10

        emp (ename, street, city)
        works (ename, compname, salary)
        company (compname, street, city)

    i. Find name of those emp who works for 'TCS'
    ii. Find name & street address of those emp who works for 'Infosys'
    iii. Find name of those emp who don't work for 'HCL'
    iv. Find name of those emp who live in the same street and city as the company for which they work.

OR

	(b)	Define relational calculus in DBMS. Consider following relational database and write following statements using tuple and domain relation calculus.	10

        customer (customer-name, customer-street, customer-city)
        account (account-number, branch-name, balance)
        loan (loan-number, branch-name, amount)
        depositor (customer-name, account-number)
        borrower (customer-name, loan-number)

    i. Find names of all customers having a loan, an account or both at the bank.
    ii. Find the loan-number, branch-name and amount for loans of over \$1200.
    iii. Find names of all customers having a loan at the Perryridge branch.
    iv. Find the names of all customers who have a loan of over \$1200.

4   (a)   Explain keys in DBMS. Consider a relation schema R = (A, B, C, D, E) on which   10
the following functional dependencies hold: {AB->CD, D->A, CB->DE}. Find
the number of candidate keys in R.

OR

(b)   Define normalization in DBMS. Normalize a relation R (A, B, C, D, E, F) up to   10
3NF, when following functional dependencies are given
{AB->C, B->E, D->F, AB->D}

5   (a)   Consider the following relational database and write the SQL syntax for the given   10
queries:
emp (eid, ename, dno)
dept (dno, dname)
sal (eid, salary)

     i.   Find those employees who works in HR Department.
    ii.   Display those emp name that contains 'n' somewhere.
   iii.   Find details of those employees whose salary is more than $4000.
   iv.   Find department name that has highest salary.
    v.   Find the average salary of each department.
   vi.   Find those department name that have at least 3 employees.

OR

(b)   Describe following: (Any three)   10
     i.   Joins
    ii.   Aggregate functions
   iii.   Triggers
   iv.   Division operator

⇔⇔⇔