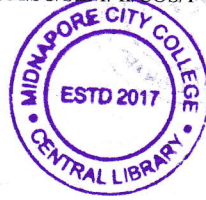**PG (CBCS)**
M.SC. Semester- II Examination, 2023
COMPUTER SCIENCE
PAPER: COS 295
(DBMS LAB & UML LAB)

Full Marks: 40

Time: 4 Hours

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
<u>**Write the answer for each unit in separate sheet**</u>
<u>**M1: DBMS LAB**</u>
<u>**GROUP-A**</u>

1. Consider the following database :
    PATIENTS (p_id, p_name, age, address)
    DOCTOR (d_id, d_name, d_add)
    ATTEND (d_id, p_id)
    ADMITTED (p_id, d_o_a)

    Write the following queries in SQL:
    a) List the total no. of doctors who check the same patient more than 2 times.
    b) List the name of patient who have the age greater than 50 and d_o_a is 09.07.2015.
    c) List the name of the patient in descending order of age.
    d) List the name of the patient whose first letter of name start with 'S' and age between 40 to 50.
    e) List the name of the patient who have the same address as doctor id 'D1008' and Doctor name 'Swarup Mahanti'.

2. Consider the following database:
    HOTEL (h_no, h_name, h_address)
    ROOM (r_no, h_no, type, r_charge)
    BOOKING (h_no, g_no, date_from, date_to, r_no)
    GUEST (g_no, g_name, g_address)

    Write the following queries in SQL:
    a) Create and insert at least 5 records in each table.
    b) Display the details of all rooms at 'Taj Hotel'.
    c) Display the details of the hotel on h_no is 1005.
    d) List the details of all guests with their room numbers staying at hotel 'Sea View' from '3rd july 2021' onwards.
    e) Display the guest's name and address who staying at 'Hindustan Hotel'.

    (P.T.O)

Consider the following database

BOOK (Book_id, Title, Publisher_Name, Pub_Year)
BOOK_AUTHORS (Book_id, Author_Name)
PUBLISHER (Name, Address, Phone)
BOOK_COPIES (Book_id, Branch_id, No-of_Copies)
BOOK_LENDING (Book_id, Branch_id, Card_No, Date_Out, Due_Date)
LIBRARY_BRANCH (Branch_id, Branch_Name, Address)

Write SQL queries to

a) Retrieve details of all books in the library — id, title, name of publisher, authors, number of copies in each branch, etc.
b) Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun 2017.
c) Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.
d) Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.
e) Create a view of all books and its number of copies that are currently available in the library.

4. Consider the following database

SALESMAN (Salesman_id, Name, City, Commission)
CUSTOMER (Customer_id, Cust_Name, City, Grade, Salesman_id)
ORDERS (Ord_No, Purchase_Amt, Ord_Date, Customer_id, Salesman_id)

Write SQL queries to

a) Count the customers with grades above Bangalore's average.
b) Find the name and numbers of all salesmen who had more than one customer.
c) List all salesmen and indicate those who have and do not have customers in their cities.
d) Create a view that finds the salesman who has the customer with the highest order of a day.
e) Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted.

5. Consider the following database

EMPLOYEE (SSN, Name, Address, Sex, Salary, SuperSSN, DNo)
DEPARTMENT (DNo, DName, MgrSSN, MgrStartDate)
DLOCATION (DNo,DLoc)
PROJECT (PNo, PName, PLocation, DNo)
WORKS_ON (SSN, PNo, Hours)

Write SQL queries to

a) Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.
b) Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise.
c) Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
d) Retrieve the name of each employee who works on all the projects Controlled by department number 5.
e) For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.

6. Consider the following relational database:
Book(Acc_no,Title,Publisher,no_of_copy,Category)
Borrower(Card_no,B_Name,B_address)
Issue(Acc_no,Card_no,Date_of_issue, Date_of_return)

Write SQL query for the following:

a) Implement the above database in SQL.
b) Find total number of "computer science" category book.
c) How many students are currently taken the book namely "Fundamental of Database Systems".
d) Show the list of books of publisher "Pearson".
e) Find the names of books having less than 5 copies.

7. Consider the following relational database:
Supplier (S#,Sname,city,status)
Parts (P#,Pname,colour,weight)
SP(S#,P#,quantity)

Write SQL query for the following:

a) Implement the above database in SQL.
b) Find names of suppliers located at same place and supply same parts.
c) Find names of suppliers who currently do not supplying any items.
d) Find the total number of suppliers.

e) Find total number of parts irrespective of its colour.

8. Database:
   Student (Name,Roll,Addr,Ph_no,Email,Subject,Standard)
   Teacher(Name,Id,Subject,Experience)

   Write SQL query for the following:

   a) Implement the above database in SQL.
   b) Find the total number of students for each standard.
   c) Find names of the teachers who belong to "Computer Science" having more than 5 years experienced.
   d) Find ratio of teacher and student.
   e) Find name of the most senior teacher.

9. Write a PL/SQL program to find average salary from EMP table. If EMP table is not available display appropriate message else print the average salary of employees.
10. Write a PL/SQL procedure/function for getting two numbers from key board and applying following one operation based on user choice:
    a) Addition
    b) Subtraction
    c) Division

M2: UML LAB

Answer any **ONE** from the following questions: 1×20

1. Write a program using LEX to recognize a valid arithmetic expression and to recognize the identifiers and operators present. Print them separately.
2. Write a program using LEX to recognize whether a given sentence is simple or compound.
3. Write a program using LEX to recognize and count the number of identifiers in a given input file.
4. Write a LEX program to count the numbers of comment lines in a given C program. Also eliminate them and copy the resulting program into separate file.
5. Write a program using LEX to count the number of characters, words, spaces and lines in a given input file.
6. Program to find whether given number is Octal or Hexadecimal.
7. Program a C program to compute the FIRST of a given grammar.
8. Lex program to recognize keywords and identifiers.
9. Lex program to count number of vowels and consonant.
10. Lex program to count the type of numbers.

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