22CS1L2: DATABASE MANAGEMENT SYSTEMS LAB

Course Name	Database Management Systems Lab			L	T	P	C	CIA	SEE	TM
Course Code	22CS1L2			0	0	6	3	30	70	100
Year of Introduction: 1991		Year of Offering: 2022	Year of Revision: 2022			Percentage of Revision: 20				
L-Lecture, T-Tutorial, **P**-Practical, **C**-Credits, **CIA**-Internal Marks, **SEE**-External Marks, **TM**-Total Marks										

Course Description and Purpose:
Database Management Systems Laboratory is a course that illustrates *DDL and DML Commands*, *Basic SQL Queries*, *Complex SQL Queries*, *Joins*, *Integrity Constraints*, *Views*, *Cursors*, *Triggers*, and *Functions and Procedures using PL/SQL*.

Course Objectives:
This course will help enable the students to understand, learn and practice develop a various *Relational Data Models*, *Querying*, *DDL and DML Commands*, *Basic SQL Queries*, *Complex SQL Queries*, *Joins*, *Integrity Constraints*, *Views*, *Cursors*, *Triggers*, and *Functions and Procedures* using PL/SQL.

Specific objectives include:
1. Database creation using DDL Commands.
2. Retrieval of Data from database using DML Commands for a given situation.
3. Use SQL commands familiarizing with a Query Language.
4. Using Nested Queries, Joins, Integrity Constraints and Views in database.
5. Demonstrating Triggers, Functions and Procedures using PL/SQL.

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:
CO1: Create database using *DDL Commands*.
CO2: Retrieve data from database using *DML Commands* for a given situation.
CO3: Familiarize with a Query Language through basic SQL Queries.
CO4: Experiment *Nested Queries*, *Joins*, *Integrity Constraints* and *Views* in database.
CO5: Demonstrate *Triggers*, *Functions* and *Procedures* using PL/SQL.

CYCLE-I
Aim: Marketing Company wishes to computerize their operations by using following tables.

Table Name: Client- Master			
Column Name	Data Type	Size	Attribute
CLIENT_ NO	Varchar2	6	Primary key and first letter must start with
NAME	Varchar2	20	Not null
ADDRESS 1	Varchar2	30	
ADDRESS S	Varchar2	30	
CITY	Varchar2	15	
PINCODE	Varchar2	8	
STATE	Varchar2	15	
BAL_DUE	Number	10,2	

Table Name: Product_ Master			
Column Name	Data Type	Size	Attribute
PRODUCT _NO	Varchar2	6	Primary key and first letter must start with
DESCRIPTION	Varchar2	15	Not null
PROFIT _PERCENT	Number	4,2	Not null
UNIT _MEASUE	Varchar2	10	
QTY_ ON_ HAND	Number	8	
REORDER_ LVL	Number	8	
SELL _PRICE	Number	8, 2	Not null, cannot be 0
COST _PRICE	Number	8,2	Not null, cannot be 0

Table Name: Salesman_Master			
Column Name	Data Type	Size	Attribute
SALESMAN_ NO	Varchar2	6	Primary key and first letter must start with ‘S’
SALESMAN _NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESS2	Varchar2	30	
CITY	Varchar2	20	
PINCODE	Number	8	
STATE	Vachar2	20	

SAL_AMT	Number	8,2	Not null, cannot be 0
TGT_TO_GET	Number	6,2	Not null, cannot be 0
YTD _SALES	Number	6,2	Not null
REMARKS	Varchar2	20	

Table Name: Sales_Order			
Column Name	Data Type	Size	Attribute
ORDER_ NO	Varchar2	6	Primary key and first letter must start with ‘S’
CLIENT _NO	Varchar2	6	Foreign Key
ORDER _DATE	Date		
DELY _ADDRESS	Varchar2	25	
SALESMAN_ NO	Varchar2	6	Foreign Key
DELY _TYPE	Char	1	Delivery: part(p)/ full(f) and default ‘F’
BILL_ YN	Char	1	
DELY_ DATE	Date		Can’t be less than order date
ORDER _STATUS	Varchar2	10	Values (“In Process”, “ Fulfilled”,

Table Name: Sales_Order_Details			
Column Name	Data Type	Size	Attribute
ORDER _NO	Varchar2	6	Primary key references SALES_ORDER table
PRODUCT_ NO	Varchar2	6	Foreign Key references SALES_ORDER_table
QTY_ ORDERED	Number	8	
QTY_ DISP	Number	8	
PRODUCT _RATE	Number	10,2	Foreign Key

Solve the following queries by using above tables

1. Retrieve the list of names, city and the state of all the clients. (CO2,L2)
2. List all the clients who are located in 'Mumbai' or 'Bangalore'. (CO2,L2)
3. List the various products available from the product_master table. (CO2,L2)
4. Find the names of sales man who have a salary equal to Rs.3000. (CO2,L2)
5. List the names of all clients having 'a' as the second letter in their names. (CO2,L2)
6. List all clients whose Bal due is greater than value 1000. (CO2,L2)
7. List the clients who stay in a city whose first letter is 'M'. (CO2,L2)
8. List all information from sales-order table for orders placed in the month of July. (CO2,L2)
9. List the products whose selling price is greater than 1000 and less than or equal to 3000. (CO2,L2)
10. Find the products whose selling price is greater than 1000 and also find the new selling price as original selling price 0.50. (CO2,L2)
11. Find the products in the sorted order of their description. (CO2,L2)
12. Find the products with description as '540HDD' and 'Pen drive'. (CO2,L2)
13. Count the total number of orders. (CO2,L2)
14. Print the description and total qty sold for each product. (CO4,L2)
15. Calculate the average qty sold for each client that has a maximum order value of 15,000. (CO4,L2)
16. Find all the products whose quantity on hand is less than reorder level. (CO4,L2)
17. List the order number and day on which clients placed their order. (CO4,L2)
18. Find out the products and their quantities that will have to deliver in the current month. (CO4,L2)
19. Find the names of clients who have placed orders worth of 10000 or more. (CO4,L2)
20. Find the client names who have placed orders before the month of June,2018. (CO4,L2)

CYCLE-II

Aim: A manufacturing company deals with various parts and various suppliers supply these parts. It consists of three tables to record its entire information. Those are as follows.
Supplier (Supplier_No, Sname, City, status) Part(Part_no, pname, color, weight, city, cost) Shipment (supplier_No, Part_no, city)
JX(project_no, project_name, city)
SPJX (Supplier_no, part_no, project_no, city)

Solve the following queries by using above tables.

1. Get supplier numbers and status for suppliers in Chennai with status > 20. (CO4,L2)
2. Get project names for projects supplied by supplier S. (CO4,L2)
3. Get colors of parts supplied by supplier S1. (CO4,L2)
4. Get part numbers for parts supplied to any project in Mumbai. (CO4,L2)
5. Find the id's of suppliers who supply a red or pink parts. (CO4,L2)
6. Find the pnames of parts supplied by London supplier and by no one else. (CO4,L2)
7. Get the names of the parts supplied by the supplier 'Mart' and 'Miller'. (CO4,L2)
8. Get supplier names for suppliers who do not supply part P2. (CO4,L2)
9. Get all pairs of supplier numbers such that the suppliers concerned are "colocated". (CO4,L2)
10. Get suppliers names for the suppliers who supply at least one red part. (CO4,L2)

CYCLE-III

Aim: An enterprise wishes to maintain a database to automate its operations. Enterprise divided into a certain departments and each department consists of employees. The following two tables describes the automation schemas.

Emp(Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, Deptno) Dept(Deptno, Dname, Loc)

Solve the following queries by using above tables.

1. List the details of employees who have joined before the end of September' 81. (CO2,L2)
2. List the name of the employee and designation of the employee, who does not report to anybody. (CO2,L2)
3. List the name, salary and PF amount of all the employees (PF is calculated as 10% of salary) (CO2,L2)
4. List the names of employees who are more than 2 years old in the organization. (CO2,L2)
5. Determine the number of employees, who are taking commission. (CO2,L2)
6. Update the employee salary by 20% , whose experience is greater than 12 years. (CO2,L2)
7. Determine the department does not contain any employees. (CO4,L2)
8. Create a view, which contains employee name and their manager names working in sales department. (CO4,L2)
9. Determine the employees, whose total salary is like the minimum salary of any department. (CO4,L2)
10. List the department numbers and number of employees in each department. (CO4,L2)
11. Determine the employees, whose total salary is like the minimum salary of any department. (CO4,L2)
12. List average salary for all departments employing more than five people. (CO2,L2)
13. Determine the names of employees, who take highest salary in their departments. (CO4,L2)
14. Determine the names of employees, who earn more than their managers. (CO4,L2)
15. Display ename, dname, even if no employee belongs to that department (use outer join). (CO4,L2)

CYCLE-IV

An Airline system would like to keep track their information by using the following relations.

FLIGHTS(fl_no: integer, from: string, to: string, distance: integer, price:
integer)AIRCRAFT(aid: integer, aname: string, cruising_range: integer)
CERTIFIED(eid: integer, aid: integer)
Employees(eid: integer, ename: string, salary: real)

Note that the employees relation describes pilots and other kinds of employees as well; every pilot is certified foraircraft and only pilots are certified to fly. Resolve the following queries.

a. Find the names of pilots whose salary is less than the price of the cheapest route from Newyork to Chicago. (CO4,L2)
b. For each pilot who is certified for more than 2 aircraft, find the eid's and the maximum cruising range of the aircraft that he or she certified for. (CO4,L2)
c. For all aircraft with cruising range over 1,500 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft. (CO4,L2)
d. Find the aid's of all aircraft than can be used from chicaga to LosAngels. (CO4,L2)
e. Find the name of the pilots certified from some Boeing aircraft. (CO4,L2)
f. Print the enames of pilots who can operate planes with cruising range greater than 3,500 miles, but are not certified by Boeing aircraft. (CO4,L2)
g. Find the eid's of employees who are certified for exactly 2 aircrafts. (CO4,L2)
h. Find the total amount paid to employees as salaries. (CO4,L2)
i. Find the aid's of all than can be used on non-stop flights from Chennai to Dubai. (CO4,L2)
j. Find the eid's of employee who make second highest salary. (CO4,L2)

PL/SQL PROGRAMS

1. Write a PL/SQL program to check the given number is strong or not. (CO5,L2)
2. Write a PL/SQL program to check the given string is palindrome or not. (CO5,L2)
3. Write a PL/SQL program to swap two numbers without using third variable. (CO5,L2)
4. Writ a PL/SQL program to generate multiplication tables for 2, 4, 6. (CO5,L2)
5. Write a PL/SQL program to check the given number is Amstrong or not. (CO5,L2)
6. Write a PL/SQL code to find the factorial of any number. (CO5,L2)
7. Write a PL/SQL program to display sum of even numbers and sum of odd numbers in the given range. (CO5,L2)
8. Write a PL/SQL program to check the given number is palindrome or not. (CO5,L2)
9. The HRD manager has decide to raise the employee salary by 15% write a PL/SQL block to accept the employee number and update the salary of that employee. Display appropriate message based on the existence of the record in Emp table. (CO5,L2)
10. Write a PL/SQL program to display to 10 rows in Emp table based on their job and salary. (CO5,L2)
11. Write a PL/SQL program to raise the employee salary by 10% for department number 30 people and also maintain the raised details in the raise table. (CO5,L2)
12. Write a procedure to update the salary of Employee, who are not getting commission by 10%.(CO5,L2)
13. Write a PL/SQL procedure to prepare an electricity bill by using following table. (CO5,L2)

Table used: Elect		
Name	Null?	Type
MNNO	NOT NULL	NUMBER(3)
CNAME		VARCHAR2(20)
CUR_READ		NUMBER(5)
PREV_READ		NUMBER(5)
NO_ UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_ TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

14. Write a PL/SQL program to prepare an telephone bill by using following table and print the monthly bills for each customer. (CO5,L2)

Table used: Phone		
Name	Null?	Type
TEL_NO	NOT NULL	NUMBER(6)
CNAME		VARCHAR2(20)
CITY		VARCHAR2(10)
PR_READ		NUMBER(5)
CUR_READ		NUMBER(5)
NET_AMT		NUMBER(5)
TOT-AMT		NUMBER(8,2)

15. Write a PL/SQL program to raise the employee salary by 10 %, who are completed their 25 years of service and store the details at appropriate tables (Define the Retair_ Emp_Table). (CO5,L2)
16. Write a PL/SQL program to evaluate the grade of a student with following conditions: For pass: all marks > 40
    For I class: Total % > 59
    For II Class: Total % between >40 and < 60 For III class: total % = 40
    And also maintain the details in abstract table. (CO5,L2)

1. Table Std		
Name	Null?	Type
NO	NOT NULL	NUMBER
NAME		VARCHAR2(10)
INTNO		NUMBER
CLASS	NOT NULL	VARCHAR2(10)
M1		NUMBER
M2		NUMBER
M3		NUMBER
M4		NUMBER
M5		NUMBER

2. Table Abstract		
Name	Null?	Type
STDNO		NUMBER
STDNAME		VARCHAR2(10)
CLASS		VARCHAR2(10)
MONTH		VARCHAR2(10)
INTNO (INTEGER NUMBER)		NUMBER
TOT		NUMBER
GRADE		VARCHAR2(10)
PERCENT		NUMBER
DAT_ENTER		DATE