FACULTY OF COMPUTER SCIENCE
Master of Computer Application (Sem-I)
In Effect from Academic Year 2023-24

Branch Name:	MCA
Program Code:	CS201
Course Name:	Relational Database Management Systems Practical
Course Code:	3CS2010104P
Pre-requisite Course:	Basic knowledge of working with computers.

Course Objectives:

1. To understand the relational database design principles
2. To understand the designing database systems and applications.
3. To understand the Implementing database systems and applications.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory (Marks)		Practical (Marks)		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total (Marks)
-	-	3	3	-	-	25	25	50

Practical Experiment

LAB/Practical

SQL QUERIES (Based on DDL statement, Constraints, DML statement, SELECT statement and Views)

Note: In all schemas, create the table with necessary constraints (PK, FK, Not Null, Unique and Check Constraints) on SQL prompt and then solve the given queries.

1 SQL Practical List:

CUST (custno, custname, addln1, addln2, city, state, phone)
ITEM (itemno, itemname, itemprice, qty_on_hand)
INVOICE (invno, invDate, custno)
INV_ITEM (invno, itemno, qty_used)

1. Create the above four tables along with key constraints.
2. Write an Insert script for insertion of rows with substitution variables and insert Appropriate data.
3. Add a column – "colour" to the Item table.
4. Display the column Item name and Price in sentence form using concatenation.
5. Find the total value of each item (item price * qty).
6. Display the list of customers belonging to "Gujarat" state.
7. Display items with unit price between`100 and ` 500.
8. Find the customers from "Lalbaug" city of Ahmedabad and Baroda.
9. Find all the customers whose name starts with the letter 'P'.
10. Find the total, average, highest and lowest unit price of an item.

2

STUDENT (rollno, name, class, birthdate)
COURSE (courseno, coursename, max_marks, pass_marks)
SC (rollno, courseno, marks)

1. Create the above three tables along with key constraints.
2. Write an Insert script for insertion of rows with substitution variables and insert Appropriate data.

3. Add a constraint that the marks entered should strictly be between 0 and 100.
4. Display details of student who takes 'Database Management System' course.
5. Display the average marks obtained by each student.
6. Select all courses where passing marks are more than 30% of average maximum mark.
7. Display details of students who are born in 1980 or 1982.
8. Create a view that displays student courseno and its corresponding marks.

3. **HOSTEL (hno, hname, haddress, total_capacity, warden_nm)**
ROOM (hno, rno, rtype, location, no_of_students, status)
CHARGES (hno, rtype, charges)
STUDENT (sid, sname, saddr, faculty, dept, class, hno, rno)
FEES (sid, fdate, famount)

The STATUS field tells us whether the room is occupied or vacant. The charges represent the term fees to be paid half yearly. A student can pay either the annual fees at one time or the half yearly fees twice a year.

1. Create the above five tables along with key constraints.
2. Write an Insert script for insertion of rows with substitution variables and insert appropriate data.
3. Display the total number of rooms that are presently vacant.
4. Display number of students who are staying in 'double' seated room for each hostel.
5. Display the warden name and hostel address of students of 'Computer Science' Department.
6. Display the hostel details where single seated or four-seated rooms are vacant.
7. Count total number of 'medical' students who live in the hostel.
8. List details about students who are staying in the double-seated rooms of "Chanakya" Hostel.
9. Display the total number of students staying in each room type of each hostel.
10. Display details about students who have paid the fees in the month of November 2011.

4. **SCREEN (screen_id, location, seating_capacity)**
MOVIE (movie_id, movie_name, date_of_release)
CURRENT (screen_id, movie_id, date_of_arrival, date_of_closure)

Value of screen_id must start with letters 'S'.
Attribute location can be any one of 'FF', 'SF', or' TF' (First floor, second floor or third floor).
Date_of_arrival must be less than the date_of_closure.
Solve the following queries based on the above schema:

1. Extract the name of movie which has run the longest in the multiplex so far.
2. Find the average duration of a movie on screen number 'S4'.
3. Get the details of the movie that closed on date 24-December-2011.

5. **WORKER (worker_id, name, wage_per_hour, specialised_in, manager_id)**
JOB (job_id, type_of_job, status)
JOB_ASSIGNED (worker_id, job_id, starting_date, number_of_days)

1. Display the date on which each worker is going to end his presently assigned job.
2. Display how many days remain for each worker to finish his job.
3. Display the STARTING_DATE in the following format – 'The fifth day of the month of October, 2011'.
4. Change the status to 'Complete' for all those jobs, which started in year 2010.
5. Display details of all those jobs where at least 25 workers are working.
6. Display all those jobs that have already been completed.
7. Find all the jobs, which will begin within the next two weeks.

6. **PUBLISHER (publ_id, publ_name, contact_person, contact_addr, contact_phone) CATEGORY (cat_id, cat_details, max_books, duration) BOOK_MASTER (book_id, bname, isbn_no, total_copies, publ_id) MEMBER (member_id, mname, cat_id, mem_ship_dt) ISSUE (ISSUE_id, member_id, book_id, issu_ret, issue_ret_dt)**

In the above tables, duration is in years and itstores the membership duration for that category.

1. Change the table design of ISSUE table to add aconstraint, which will allow only 'I' or 'R' to be entered in the ISSUE_RETcolumn, which stores the action whether the book is being issued or returned.
2. Add a column to the MEMBER table,which will allow us to store the address of the member.
3. Create a table LIBRARY_USERS which has a structure similar to that of the MEMBER table but with no records.
4. Give details about members who have issued books, which contains the word 'DATA' somewhere in their titles.
5. Display the books that have been issued at the most three times in the year 2011.
6. Display the details of books issued right now that is published by "Pearson".
7. Display the details of books whose all copies are issued.

7. **APPLICANT (aid, aname, addr, abirth_dt) ENTRANCE_TEST (etid, etname, max_score, cut_score) ETEST_CENTRE (etcid, location, incharge, capacity) ETEST_DETAILS (aid, etid, etcid, etest_dt, score)**

This database is for a common entrance test which can be conducted at a number of centers and can be taken by an applicant on any day except holidays.

1. ModifytheAPPLICANTtablesothateveryapplicantidhasan'A'beforeitsvalue.For example, if the applicant id '1123', it should now become 'A1123'.
2. Display the test center details where no tests will be conducted.
3. Display the details about applicants who have the same score as that of "Jaydev" in "Oracle Fundamentals".
4. Display the details of applicants who have appeared for all the tests.
5. Display those tests where no applicant has failed.
6. Display details of entrance test centers which had full attendance between 1st November and 15th November 2011.
7. Display the details of those applicants who have scored more than the cut-off score in the tests they have appeared in.
8. Display the average and the maximum score, test wise of the tests conducted at Mumbai.
9. Display the number of applicants who have appeared for each test, test center wise.

PL/SQL

1 **PL/SQL Practical List:**
Competition (Comp_code, Comp_name (Dancing, Painting, GK, etc.))
Participants (Part_no, Part_name, DOB, Address, EmailID, Contact_number)
Scorecard (Part_no, Comp_code, Judge_no [1, 2, 3], Marks)Implement the Following:

Create a PL/ SQL block to prepare report in following format.
Display the score card in the following format, for the Participant whose ID/ Name should be provided by the user.

Talent Winner 2011 ::: <Participant's Name>

Competition name	Judge1	Judge2	Judge3
1. Painting			
2. Dancing			

Total Marks:

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2 **Customer (Cust_Id, Cust_Name, Cust_Addr, Cust_City, EmailID,Contact_No)**
Magazine (Mag_Id, Mag_Name, Unit_Rate, Type_of_subsciption [weekly, monthly, etc.])
Subscription (Cust_Id, Mag_Id, start_date, end_date)

Implement the following:

A)

1.Create a View that displays Customer name, Magazine name along with its rate which was Subscribed during 01-Sept-2010 to 01-Feb-2011.

2. Find top three magazines having the highest sale during last one month of time.

B)

1. Create a function to return No. of customers in city Gandhinagar who have subscribed the Magazine 'Outlook' after August 2010. If no such customer exists, throw a user defined Exception with appropriate message.
2. Create a trigger that is fired after an INSERT statement is executed for the Customer Table. The trigger writes the new customer's code, name and the sysdate in a table called Customer Log(create the table Customer Log)

3 **Account (ac_no, ac_name, act_type)**
Transaction (ac_no, trans_date, tran_type, tran_amount, balance)
Note: Act_type may be 'S' for saving or 'C' for current and tran_type may be 'D' for deposit or 'W' for withdrawal.
Implement the following:

A).

1. Find out those saving transactions that took place between 10th January201120th January 2011 have withdrawn an amount greater than Rs. 50,000.
2. Create a Sequence that can be used to enter new account number into the account Table. Add a new record into Account table using the created sequence.

B)

1. Create a trigger not allowing insertion, deletion or updation on Saturday and before 8:00 AM & after 6:00 PM on Account table.
2. Create a package for the following :
   Create a function to return the current balance for a given account number.

4 **Movie (movie_id, movie_name, date_of_release)**
Screen (screen_id, location, max_capacity)
Current (movie_id,screen_id, date_of_arrival, date_of_closure)
Note:
Value of screen_id must with letter 'S'.
Screen location can by any one of 'FF', 'SF', and 'TF'.
Date_of_arrival must be less than Date_of_closure.
Max_capacity attribute should have a value greater than 0.

Implement the following:

A)

1. Find the top three movies which have the highest screened record.
2. Create a View which displays the movie details along with the information about the screen on which it is currently screened.

B)

1. Create a trigger that is fired after an INSERT statement is executed for the Movie table. The trigger writes the new movie's code, movie name and the sysdate in a table called Movie_Log.(create the table Movie_Log)
2. Create a function that get the Screen Code from the user and displays the movie name currently screened on it. If the given screen code does not exist, throw a user defined exception with appropriate message.

5 **Employee_master(EmpCode , Emp_Name , Dept_Id, Emp_Address , DOB , Basic_Salary Department_master(Dept_Code ,Dept_Name)**

Implement the following:

A)

1. Create a View that displays some Employee details such as Employee code, Employee name, Department Name and their Basic Salary.
2. Find those employees who do not belong to Department D102 or D105. (Note: Use set operator)

B)

Create a PL/ SQL block to prepare report in the following format:
Display the salary slip for the employee in the following format, who's Employee Code is provided by the user.

Salary Slip for the month March 2012.

Employee Code: <E102> Employee Name: <JohnSmith>

Department Name: <Finance>

Basic Salary	**DA**	**HRA**	**Medical**	**P.F.**

Deductions:

Total Salary : _____

Note:

HRA is 15% of basic salary
DA is 30% of basic salary
Medical is 1% of basic salary
P.F. is 10% of basic salary

6 **Book_catalog (book_code, title, Publisher_Name, Category_Name, yr_of_release, total_copies)**
Member (member_code, member_name,mem_ship_dt)
Issue (Issue_id, member_code, book_code, issu_ret, issue_date, issue_ret_dt)
Note:
Add a constraint to Issue table, which will allow only 'I' or 'R' to be entered in the ISSUE_RET column, which stores the action whether the book is being issued or returned. Implement the following: A)

1. Find the book details which are currently issued to the members and have crossed the return date, get details starting with the current date.
2. How many members have registered in the last three months? Display their details.

B)

1. Create a function which provides the total number of copies available for the issue for a given book. Book Code to be provided by the user.
2. Create a package for the following:
   Create a function to print the book title when Book code is been supplied by the user.

Text Books:

1. "SQL,PL/SQL The programming language of oracle", 3rd revised edition, Ivan Bayross, BPB Publication.
2. C J Date, A Kannan, S Swaminathan, "An Introduction to Database Systems", 8th Edition, Pearson Education (2006).

Reference Books:

1. Silberschatz, Korth, Sudarshan, "Database System Concepts", 5th Edition, McGraw Hill Publication
2. S K Singh, "Database Systems : Concepts, Design and Applications", Pearson Education
3. Elmsari, Navathe, "Fundamentals of Database Systems", 5th Edition, Pearson Education (2008)
4. Peter Rob, Carlos Coronel, "Database Systems : Design, Implementation and Management", 7th Edition, Cengage Learning (2007)

List of Open Source Software/learning website:

1. https://www.tutorialspoint.com/plsql/index.htm
2. https://www.w3schools.com/sql/
3. https://www.w3schools.com/mysql/mysql_rdbms.asp

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom'sTaxonomyLevel
CLO1	The fundamental elements of relational database management systems	2 Understanding
CLO2	Design ER-models to represent simple database application scenarios	1 Remembering 3 Applying,
CLO3	Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods	2 Understanding, 3 Applying,
CLO4	Working on existing database systems, designing of database, creating relational database, analysis of table design.	3 Applying, 2 Understanding
CLO5	Ability to store information without unnecessary redundancy.	5,3, 4 Evaluate,Applying, Analyze
CLO6	Effective transformation of the real-world data into the relational data model of the Database system and data retrieval.	6 Creating 5 Evaluate

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Mapping of CLOs with Pos & PSOs

Course LearningOutcomes	Program Outcomes(POs)													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CLO1	**M**	**M**	**L**		M		**L**	M	L	M		**M**	**H**	**M**
CLO2	M	M	H			**M**	M			**H**	L	L	**H**	**M**
CLO3	H	M	H		**M**	**M**		**M**	L	M		H	**L**	**M**
CLO4	M		**H**	**M**	M	**L**	M	**L**	**M**		H	H	H	**M**
CLO5	H		**M**	**M**	**M**	**M**	**L**	**H**	**H**	M	H	H	H	**L**
CLO6	H	M						**H**	**L**	**L**	M	**H**	H	**H**

H:High, M:Medium, L:Low