| SANKALCHAND PATEL UNIVERSITY ।। अथातो ज्ञानजिज्ञासा ।। | **FACULTY OF COMPUTER SCIENCE**<br>**Master Of Computer Application (Integrated) (Sem-III)**<br>In Effect from Academic Year 2023-24 |
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| **Branch Name:** | **IMCA** |
| **Program Code:** | **CS201** |
| **Course Name:** | **DATABASE MANAGEMENT SYSTEMS-II** |
| **Course Code:** | **1CS3010304P** |
| **Pre-requisite Course:** | **Basic knowledge of Database Management System** |

## Course Objectives:

This course is intended to give students basic fundamental knowledge about SQL Database.

| **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:**

**Tools:** Oracle 10g or above

**Topics:**

| | |
|---|---|
| 1 | Data Types |
| 2 | Study of DDL Commands ( Create , Alter , drop )<br>Table: The Create Table Command, Creating a table from a table (with data, without data, with all columns, with selected columns), Drop Table, Alter Table, Renaming Tables |
| 3 | Study DML Commands ( Select, insert, update, delete ) |
| 4 | Constraints: Defining integrity constraints using create table and the alter table command, Dropping integrity constraints in the alter table command |
| 5 | Transaction Control statements: Commit, Rollback |
| 6 | Advanced Concepts: View, Index, Sequences, rowed, row num, Default Value Concept |
| 7 | Join (Inner Join, Equi Joins, Self Join, Outer Joins) |
| 8 | Study subquery concepts |
| 9 | Set Operators |
| 10 | Study single row functions: String functions, Numeric Functions, Date Functions, |
| 11 | Study aggregate / group functions, having |
| 12 | Sorting Data, Handling Null values ( IS NULL), Like Clause |

**SET 1**

DEPARTMENT (dept_no, dept_name, location)

1. Create the Simple DEPARTMENT Table.
2. Display structure of department table.
3. Insert below records into Department Table

| Dept_no | Dept_name | Location |
|---|---|---|
| 10 | Account | NY |
| 20 | HR | NY |
| 30 | Production | DL |
| 40 | Sales | NY |
| 50 | EDP | MU |
| 60 | TRG | |
| 110 | RND | AH |

4. Display all records of Department table
5. Display all department belonging to location 'NY'
6. Display details of Department 10
7. List all department names starting with 'A'
8. List all departments whose number is between 1 and 100
9. Delete 'TRG' department
10. Change department name 'EDP' to 'IT

**SET 2**

EMPLOYEE (emp_id, emp_name, birth_date, gender, dept_no, address, designation, salary, experience, email)
DEPARTMENT (dept_no, dept_name, location)

Do as directed:

1. Create the EMP Table with all necessary constraints such as

In EMP TABLE: Employee id should be primary key, Department no should be Foreign key, employee age (birth_date) should be greater than 18 years, salary should be greater than zero, email should have (@ and dot) sign in address, designation of employee can be “manager”, “clerk”, “leader”, “analyst”, “designer”, “coder”, “tester”.

1. Create DEPT table with necessary constraint such as
2. Department no should be the primary key, department name should be unique.
3. After creation of above tables, modify Employee table by adding the constraints as
4. ‘Male’ or ‘Female’ in the gender field and display the structure.
5. Insert proper data (at least 5 appropriate records) in all the tables.
6. Describe the structure of table created
7. List all records of each table in ascending order.
8. Delete the department whose location is Ahmedabad.
9. Display female employee list
10. Display Department name wise employee Names
11. Find the names of the employee who has a salary less than 5000 and greater than 2000.
12. Display the names and the designation of all female employees in descending order.
13. Display the names of all the employees whose names start with ‘A’ and end with ‘A’.
14. Find the name of the employee and salary for those who had obtained minimum salary.
15. Add 10% raise in salary of all employees whose department is ‘IT’.
16. Count the total number of employees of the ‘IT’ department.
17. List all employees who were born in the current month.
18. Print the record of employee and dept table as “Employee works in department ‘MBA’.

19. List names of employees who are fresher's (less than 1 year of experience).
20. List department wise names of employees who have more than 5 years of experience.
21. Crete Sequence to generate department ID
22. List department having no employees

**SET 3**

**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. While creating the SC table, composite key constraint was forgotten. Add the composite keynow.
5. Display details of students who take the 'Database Management System' course.
6. Display the names of students who have scored more than 70% in Computer Networksand have not failed in any subject.
7. Display the average marks obtained by each student.
8. Select all courses where passing marks are more than 30% of average maximum mark.
9. Display details of students who were born in 1980 or 1982.

**SET 4**

Create the database COMPANY and create given tables with all necessary constraints such as primary key, foreign key, unique key, not null and check constraints.

EMPLOYEE (emp_id, emp_name, birth_date, gender, dept_no, address, designation, salary, experience, email)
DEPART (dept_no, dept_name, total_employees, location)
PROJECT (proj_id, type_of_project, status, start_date, emp_id)

Insert proper data (at least 5 appropriate records) in all the tables.

Do as directed:

1. Delete the department whose total number of employees is less than 1.
2. Display the names and the designation of all female employees in descending order.
3. Display the names of all the employees whose names start with 'A' and end with 'A'.
4. Find the name of employee and salary for those who have obtained minimum salary.
5. Add 10% raise in salary of all employees whose department is 'CIVIL'.
6. Count total number of employees of 'MCA' department.
7. List all employees who were born in the current month.
8. Print the record of employee and dept table as "Employee works in department 'CE'.
9. List names of employees who are fresher's(less than 1 year of experience).
10. List department wise names of employees who have more than 5 years of experience.
11. Write a function which will display the total number of projects based on status (pass status

as parameter).
12. Write a procedure that will display a list of projects which are going to start today.
13. Write a trigger which do not allow insertion/updation/deletion into Project table if status type is 'pending'

**SET 5**

Create the database STUD and create tables with all necessary constraints such as primary key, foreign key, unique key, not null and check constraints.

HOSTEL (HNO, HNAME, HADDR, TOTAL_CAPACITY, WARDEN)
ROOM (HNO, RNO, RTYPE, LOCATION, NO_OF_STUDENTS, STATUS)
CHARGES (HNO, RTYPE, CHARGES)
STUDENT (SID, SNAME, MOBILE-NO, GENDER, 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.
Insert proper data (at least 5 appropriate records) in all the tables.

Do as directed:

1. Display the total number of rooms that are presently vacant.
2. Display number of students of each faculty and department wise staying in each hostel.
3. Display hostels, which have at least one single-seated room.
4. Display the warden name and hostel address of students of the Computer Science department.
5. Display those hostel details where single seated or double-seated rooms are vacant.
6. Display details of hostels occupied by medical students.
7. Display hostels, which are totally occupied to its fullest capacity.
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 fees in the month of Nov. 2017.
11. For those hostels where total capacity is more than 300, display details of students studying in Science faculty.
12. Display hostel details where there are at least 10 vacant rooms.
13. Display details of students who have still not paid fees.

**SET 6**

Create the database HOSPITAL and create given tables with all necessary constraints such as primary key, foreign key, unique key, not null and check constraints.

DOCTOR (DNO, DNAME, SPECIALIZATION, CLINIC_ADDR)
MEDICINE (MNO, MNAME, TYPE, CONTENT, MANUFACTURER)
DISEASE (DISEASE_NAME, SYMPTOM1, SYMPTOM2, SYMPTOM3)
TREATMENT (TNO, DNO, DISEASE_NAME, MNO, DOSAGE, AVG_CURE_TIME)

Insert proper data (at least 5 appropriate records) in all the tables.

Do as directed:

1. Display records of each table in ascending order.
2. Count the total number of doctors which have not given any treatment.
3. Display all Chennai doctors who treat cancer.
4. Remove disease "polio" from the disease table as well as the treatment table.
5. Delete all those treatments related to the liver of Dr.Shah.
6. Create index on dno, Disease name in the treatment table.
7. Display details of doctors who treat migraines.
8. What is the maximum dosage of "penicillin" prescribed by the doctor for the treatment of any disease?
9. Display total number of diseases treated by every doctor.
10. Which doctor has no treatment for "depression"?

**SET 7**

Create the database SHOPPING and create given tables with all necessary constraints such as primary key, foreign key, unique key, not null and check constraints.

CUSTOMER (cno, cust_name, cust_phone, location,gender)
ITEM (itemno, itemname, color, weight, expire_date, price, shop_name)
CUST_ITEM (cno, itemno, quantity_purchased, date_purchase)

Insert proper data (at least 5 appropriate records) in all the tables.

Do as directed:

1. Delete the items whose price is more than 50000.
2. Find the names of the customer who is located in the same location as that of the other customer.
3. Display the names of items which is black, white & brown in color.
4. Display the names of all the items whose names lie between 'p' and s'.
5. Find the item which is having less weight.
6. Add one month more to those items whose item no =40.
7. Count total number of items which is going to expire in next month
8. List all customers whose phone number starts with '99'.
9. Display total value (qty*price) for all items.
10. List customer details who has purchased maximum number of items
11. Display total price item wise.
12. List name of items, customer details and qty purchased.

**SET 8**

Create the database THEATRE and create given tables with all necessary constraints such as primary key, foreign key, unique key, not null and check constraints.

SCREEN (SCREEN_ID, LOCATION, SEATING_CAP) MOVIE (MOVIE_ID, MOVIE_NAME, DATE_OF_RELEASE)
**CURRENT (SCREEN_ID, MOVIE_ID, DATE_OF_ARRIVAL, DATE_OF_CLOSURE)**

Check Constraints:

Value of screen_id must start with letters 'S'.
Attribute location can be any one of 'FF', 'SF', or 'TF'.

Do as directed:

1. Get the name of the movie which has run the longest in the multiplex so far.
2. Get the average duration of a movie on screen number 'S4'.
3. Get the details of the movie that closed on 24-november-2004.
4. Movie 'Star Wars III 'was released in the 7th week of 2005. Find out the date of its release considering that a movie releases only on Friday.

Get the full outer join of the relations screen and current.

**SET 9**

Create the database EXAM and create tables with all necessary constraints such as primary key, foreign key, unique key, not null and check constraints.

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 is being conducted at a number of centers and can be taken by an applicant on any day except holidays)

Do as directed:

1. Modify the APPLICANT table so that every applicant id has an 'A' before its value. E.g. if value is '1123', it should become 'A1123'.
   Display test center details where no tests were conducted.
   Display details about applicants who have the same score as that of Ajaykumar in 'ORACLE FUNDAMENTALS'.
2. Display details of applicants who appeared for all tests.
3. Display those tests where no applicant has failed.
4. Display details of entrance test centers which had full attendance between 1st Oct 15 and 15th Oct 16.
5. Display details of the applicants who scored more than the cut score in the tests they appeared in.
6. Display average and maximum score test wise of tests conducted at Mumbai.
7. Display the number of applicants who have appeared for each test, test center wise.
8. Display details about test centers where no tests have been conducted.
9. For tests, which have been conducted between 2-3-17 and 23-4-17, show details of

the tests as well as the test centre.

10. How many applicants appeared in the 'ORACLE FUNDAMENTALS' test at Chennai in the month of February?
11. Display details about applicants who appeared for tests in the same month as the month in which they were born.
12. Display the details about APPLICANTS who have scored the highest in each test, test centre wise.

**SET 10**

Create the database BUS TRANSPORT and create given tables with all necessary constraints such as primary key, foreign key, unique key, not null and check constraints.

CATEGORY (CAT_CODE, CATDESC)

**ROUTEMASTER (ROUTENO, ORIGIN, DESTINATION, FARE, DISTANCE, CAPACITY, DAY, CAT_CODE)**

TICKETHEADER (TICKETNO, DATEOFISSUE, DATEOFTRAVEL, BOARDPLACE, ROUTENO)

**TICKET DETAILS (TICKETNO, NAME, SEX, AGE, FARE)**

ADD THE FOLLOWING CONSTRAINTS:

1. DELUXE, SUPERDELUXE, SUPERFAST AND NORMAL ARE THE CATDESC
2. ORIGIN AND DESTINATION CANNOT BE SAME,
3. CAPACITY SHOULD BE>0 AND <=60

Do as directed:

1. Display the total number of people travelled on each ticket group by ticket no 23.
2. Give the total collection of fare for each route.
3. Give the number of months between issue date and travel date of each ticket issued.
4. Count the number of people boarding from the same place and the same route.
5. Display count of people who have travelled in each category.

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

| CLO | Description | Bloom's Taxonomy Level |
|---|---|---|
| CLO1 | The fundamental elements of database management systems | 2 Understanding |
| CLO2 | Familiar with basic Transaction management concept and execution techniques: serialization and schedules | 1 Remembering<br>3 Applying, |
| CLO3 | Familiar with basic Concurrency control and its techniques | 2 Understanding,<br>3 Applying, |
| CLO4 | To understand the concepts necessary for database Recovery and Security using and implementing database.Working on existing database systems, designing of database. | 2 Understanding<br>3 Applying, |
| CLO5 | To Ability to create, inserts, update, and delete database information using Database administrative. | 1. Remember<br>2. Understand<br>3. Apply<br>4. Create<br>5. Evaluate |
| CLO6 | Effective transformation of the real-world data into the relational data model of the Database system and data retrieval. | 1. Understand<br>2. Apply<br>3. Create |

**Mapping of CLOs with Pos & PSOs**

| Course Learning Outcomes | Program Outcomes(POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Learning Outcomes** | **PO 1** | **PO 2** | **PO 3** | **PO 4** | **PO 5** | **PO 6** | **PO 7** | **PO 8** | **PO 9** | **PO10** | **PO 11** | **PO 12** | **PSO 1** | **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**