PMCA503P DATABASE SYSTEMS LAB

Cycle Sheet

Consider the following relational database schema for teaching-learning process in a university.

(Source: Database Systems – Coronel & Morris)

PROFESSOR(Prof_id, Prof_name, Email, Mobile, Specialty, Dept_id)

SCHOOL(SCode, Scl_name, Prof_id, Location)

DEPARTMENT(Dept_id, Dname, SCode, Prof_id)

COURSE(Crs_code, Crs_name, Description, Credits, Hours)

CLASS(Cls_code, Slot, Stime, Etime, Crs_code, Prof_id, Room_no, Sem_code, Day_of_week)

SEMESTER(Sem_code, Term, Year, Sdate, Edate)

STUDENT(Reg_no, Sname, Address, DoB, Email, Mobile, Dept_id, Prof_id)

ENROLL(Cls_code, Reg_no, Enroll_time, Grade)

STUDENT_VISA(Reg_no, Visa_status)

PROGRAMME(Prog_code, Prog_name, Prog_preamble, Scode, Dept_id)

The primary keys are underlined and foreign keys are self-explanatory. The Dept_id column in professor table stands for the department the professor belongs to and Prof_id column in the school table stands for the professor who chairs the school, the same column in the department table stands for the professor who heads the department, the domain of Term column in semester table is {Winter, Fall}.

CYCLE SHEET-SQL

1. Create the above tables.

2. Enter data into the above tables. (Learn how to enter data interactively also.). Display the content of each table. Use column formatting while displaying.

3. Alter or Recreate the above tables with primary key and foreign key and the following integrity constraints assigning name to integrity constraint.

i) Prof_id must have exactly five characters and their email and mobile number are unique. The email address must have @ as one of the characters and mobile number must have exactly ten characters.

ii) Use timestamp data type without fractional parts of seconds for start time and end time column of class table.

iii) The Sem_code should start with either 'Win' or 'Fall' and Term column can assume only one of two values {Winter, Fall}.

iv) Email and mobile column in student table should have same characteristics as those in professor table.

v) The enroll_time in the enroll table should be of timestamp data type without fractional parts of seconds. The grade may assume one of the values in {'S', 'A', 'B', 'C', 'D'}

vi) Use 'on delete cascade' or 'on delete set null' clause as requirements. Use deferrable constraint, if required.

vii) Additional (innovative) integrity constraints, if any, may be specified by you.

4. In built functions

(i) Test the string manipulation functions – UPPER, LOWER, INITCAP, LENGTH, LPAD, RPAD, LTRIM, RTRIM and TRIM, using select queries on data present in the tables. Use one query each for demonstration of one function.

(ii) Write query to illustrate usage of NVL function and NULLIF function.

(iii) Display the name of the students who were born on a specified month.

(iv) Display the name of the students with a specified date of birth.

(v) Display the date of birth of a specified student in the format 'Day of week, Month dd, yyyy'.

(vi) Display the hour and minutes of the start time and end time of a specified slot.

(vii) Display the day of week of the start date and end date of Winter semester 17–18.

(viii) Display the duration of Winter semester 17–18 in terms of number of weeks.

(ix) Store date in the format dd/mm/yy for DOB of newly admitted student.

(x) Test the numeric functions – CEIL, FLOOR, TRUCATE, MIN, MAX, AVG,COUNT using select queries on data present in the tables. Use one query each for demonstration of one function.

5. Write Queries for

(i) Display name, email address and address for those students who live in Katpadi area and whose name has an l as the third character.

(ii) Display name, email address and address for those students who are not from Tamil Nadu.

(iii) Display name, email address and address of foreign students only.

(iv) List the name of professors along with their specialty who belong to School of Medicine.

(v) Display name of the school and name of professor who chairs the school.

(vi) List course code, course name and course description in alphabetic order of course code.

(vii) Change the mobile number of a student interactively.

(viii) Remove enrollment information of a student from a particular course interactively. How would you recover the data?

(ix) Create a duplicate of course table.

(x) Create a view for list of students (Reg_no, Sname) and the courses they have registered along with name of professors teaching the course.

(xi) List the room number, slot, start time, end time and duration of every class held on Wednesdays in descending order of room number.

(xii) Display the name and grade of a student in different courses underwent in fall semester 2017 – 18.

(xiii) Find out name of students who have taken Database Systems course as well as Operating Systems course in fall semester 2016 – 17.

(xiv) Find out name of students who have taken Database Systems course but have not taken Operating Systems course in winter semester 2017 – 18.

(xv) List the registration number and name of the students who have registered for maximum number of credits in Winter 17-18 semester.

(xvi) List the name of the course and the number of students registered in each slot for course under different faculty members.

(xvii) Find out the name of the students who have registered in all the courses being taught by Prof. O'Brien in Winter 17-18.

(xviii) List the registration number of the students who registered in Database Systems course on November 17, 2017

(xix) Write a query to display the grade of a student given his/her registration number and the course name for Fall semester 17–18.

(xx) List the name of departments and the name professors who is in charge of the department.

(xxi) List the name of schools with students' strength higher than 7000.

(xxii) List the name of the department(s) under school of medicine with student strength higher than the average students of all the departments in the school.

(xxiii) Given the registration number of a student, display the total credits registered by him/her in Winter 17–18.

(xxiv) Given the registration number of a student, display her/his grade in the course she/he registered in Fall 17–18.

(xxv) Display the name of the courses that are not being offered in Winter 17–18.

(xxvi) Write necessary SQL statement to advance the start time and end time of every class by ten minutes in Fall 18–19.

(xxvii) Write necessary SQL statement to advance the start date and end date of Fall 18–19 semester by one week with respect to Fall semester of 17 – 18.

(xxviii) Find out the name list of students who had secured 'S' grade in at least 50% of the courses cleared by her/him.

(xxix) Given the registration number of a student, find out his/her free slots.

(xxx) Find out the name list of students who have classes in the afternoon session only a specific day of the week.

(xxxi) Add a column named 'Duration' (to indicate duration of a class) with appropriate data type to the CLASS table and populate the column from values of start time and end time columns.

(xxxii) Add a column named 'SemesterDuration' (indicating duration of a semester) with appropriate data type to the SEMESTER table and populate the column from values of start date and end date columns.

(xxxiii) Find out the list of students who are undergoing MCA program.

(xxxiv) Display the name of programs and the name of school offering the program.

(xxxv) Display the name of the departments and the name of the program controlled by the department.

(xxxvi) Find the school which has highest school strength (i.e number of students)

CYCLE SHEET-PL/SQL

1.Write a PL/SQL block to get the student register number and print the student details such as sname, address, dob, email and mobile number.

2. Write a PL/SQL block the get the professor id and update the mobile number of the professor.

3. Write a PL/SQL procedure to display the message as 'Excellent', 'Good', and 'Fair' depending on the Grade of a student in a course.

4. Write a PL/SQL procedure to print the number of 'S' grades that a student has obtained.

5. Write a PL/SQL program to print the regno and student names who are studying in the first semester.

6. Write a PL/SQL program to find out what are all the courses that a professor has handled in the semester 1 and 2.

7. Implement and test a trigger to ensure that a student cannot enroll in a course after the semester has started.

8. Implement and test a trigger to ensure that number of departments in a school cannot exceed three.

9. Write a trigger to subside referential integrity constraint. (Choose tables of your choice)

10. Write a PL/SQL program to interchange the department of Professor 15629 and 12212.

11. Create a function that takes department ID and returns the name of the Head of the department.

12. Create a function that displays the age of the student from his DOB.