DBMS LAB CYCLE

CYCLE 1

NO:	EXPERIMENT TITLE
1.	FAMILIRISATION OF DATABASE MANAGEMENT SYSTEMS
2.	DDL COMMANDS
3.	DML COMMANDS
4.	DQL COMMANDS
5.	TCL COMMANDS
6.	DCL COMMANDS
7.	VIEWS AND ASSERTIONS
8.	BUILT IN FUNCTIONS
9.	AGGREGATE FUNCTIONS
10.	ORDER BY, GROUP BY &HAVING CLAUSE

CYCLE 2

11.	PL/SQL
12.	PROCEDURE AND FUNCTIONS
13.	PACKAGES
14.	TRIGGERS AND CURSORS

Experiment No. 1

FAMILIARISATION OF DATABASE MANAGEMENT SYSTEMS

1. DATABASE
2. DATABASE MANAGEMENT SYSTEMS
3. SQL
4. DDL COMMANDS
5. DML COMMANDS
6. DQL COMMANDS
7. TCL COMMANDS
8. DCL COMMANDS
9. VIEWS AND ASSERTIONS
10. BUILT IN FUNCTIONS
11. AGGREGATE FUNCTIONS
12. ORDER BY, GROUP BY &HAVING CLAUSE
13. SET OPERATORS, NESTED QUESRIES
14. JOIN QUERIES

COMMANDS (definition with syntax)

Viva Topics: Introduction to Database and DBMS, Three schema architecture, Database architecture and its classification, structure of relational databases, Normal Forms

Experiment No. 2

DDL COMMANDS

1. Create the tables described below:

   Classroom(building,room_number, capacity)

   Department(dept_Name,building,budget)

   Course(course_id,title,dept_name,credits)

   Instructor(ID,name,dept_name,salary)

   Student(ID,name,dept_name,tot_cred)

   Section(course_id,sec_id, semester,year,building,room_number)

   Teaches(ID,course_id,sec_id,semester,year)

   Takes(ID,course_id,sec_id,semester,year,grade)

2. Modify the table
   a. **Course** such that the data type of course_id to varchar(10)
   b. **Department** to add a new column **dept_no** of data type number
   c. **Student** such that the contents of the column **name** should not be NULL
   d. **Classroom** such that the default value for column **capacity** as 50
   e. **Department** such that the contents of column**dept_name** should be unique
   f. **Instructor** such that the values for the column salary should be greater than 50000
3. Remove all constraints and modifications that are given to the database
4. Change the name of table **takes** to **subject**

building	*room_number*	*capacity*
Packard	101	500
Painter	514	10
Taylor	3128	70
Watson	100	30
Watson	120	50

Figure A.3 The *classroom* relation.

dept_name	*building*	*budget*
Biology	Watson	90000
Comp. Sci.	Taylor	100000
Elec. Eng.	Taylor	85000
Finance	Painter	120000
History	Painter	50000
Music	Packard	80000
Physics	Watson	70000

Figure A.4 The *department* relation.

ID	*name*	*dept_name*	*salary*
10101	Srinivasan	Comp. Sci.	65000
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

Figure A.6 The *instructor* relation.

course_id	*title*	*dept_name*	*credits*
BIO-101	Intro. to Biology	Biology	4
BIO-301	Genetics	Biology	4
BIO-399	Computational Biology	Biology	3
CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	Game Design	Comp. Sci.	4
CS-315	Robotics	Comp. Sci.	3
CS-319	Image Processing	Comp. Sci.	3
CS-347	Database System Concepts	Comp. Sci.	3
EE-181	Intro. to Digital Systems	Elec. Eng.	3
FIN-201	Investment Banking	Finance	3
HIS-351	World History	History	3
MU-199	Music Video Production	Music	3
PHY-101	Physical Principles	Physics	4

Figure A.5 The *course* relation.

ID	*name*	*dept_name*	*tot_cred*
00128	Zhang	Comp. Sci.	102
12345	Shankar	Comp. Sci.	32
19991	Brandt	History	80
23121	Chavez	Finance	110
44553	Peltier	Physics	56
45678	Levy	Physics	46
54321	Williams	Comp. Sci.	54
55739	Sanchez	Music	38
70557	Snow	Physics	0
76543	Brown	Comp. Sci.	58
76653	Aoi	Elec. Eng.	60
98765	Bourikas	Elec. Eng.	98
98988	Tanaka	Biology	120

Figure A.9 The *student* relation.

course_id	sec_id	semester	year	building	room_number
BIO-101	1	Summer	2009	Painter	514
BIO-301	1	Summer	2010	Painter	514
CS-101	1	Fall	2009	Packard	101
CS-101	1	Spring	2010	Packard	101
CS-190	1	Spring	2009	Taylor	3128
CS-190	2	Spring	2009	Taylor	3128
CS-315	1	Spring	2010	Watson	120
CS-319	1	Spring	2010	Watson	100
CS-319	2	Spring	2010	Taylor	3128
CS-347	1	Fall	2009	Taylor	3128
EE-181	1	Spring	2009	Taylor	3128
FIN-201	1	Spring	2010	Packard	101
HIS-351	1	Spring	2010	Painter	514
MU-199	1	Spring	2010	Packard	101
PHY-101	1	Fall	2009	Watson	100

Figure A.7 The *section* relation.

ID	course_id	sec_id	semester	year
10101	CS-101	1	Fall	2009
10101	CS-315	1	Spring	2010
10101	CS-347	1	Fall	2009
12121	FIN-201	1	Spring	2010
15151	MU-199	1	Spring	2010
22222	PHY-101	1	Fall	2009
32343	HIS-351	1	Spring	2010
45565	CS-101	1	Spring	2010
45565	CS-319	1	Spring	2010
76766	BIO-101	1	Summer	2009
76766	BIO-301	1	Summer	2010
83821	CS-190	1	Spring	2009
83821	CS-190	2	Spring	2009
83821	CS-319	2	Spring	2010
98345	EE-181	1	Spring	2009

Figure A.8 The *teaches* relation.

ID	course_id	sec_id	semester	year	grade
98988	BIO-301	1	Summer	2010	*null*

Figure A.10 The *takes* relation.

Viva Topics:

Define DDL, DML, DQL, DCL, TCL.
Types of DDL commands, Syntax of DDL commands (Create Alter, Drop,....),
Types of constraints with examples
Domain Constraints
Entity constraints
Key constraints
Referential Integrity constraints,
adding constraints-its syntax

Experiment no: 3

DML COMMANDS

1. Insert data into given tables

2. Modify the table

- **Student** such that change the name of student as ‘Mozart’ whose Id is 45678
- **Department** such that budget of history department is 100000 and building as Taylor
- **Instructor** such that the salary of each instructor increases by 10%
- **Course** such that the credits of all courses under computer science department is 4
- **Student** such that additional 10 points should be given to the total credits of students who have total credits in between 20 to 50

- **Instructor** such that a salary raise of 5% to be given to instructors whose salary is less than the average salary.
- **Teaches** such that for the course with course id ‘CS-101’ which is under ‘Fall’ semester , change year of the course to 2010

3. Delete all the student information whose total credits are zero.

4. Delete the record from instructor whose id starts with ‘765’

5. Delete all courses that have never been offered (i.e., which do not occur in the section relation)

Viva Topics:

Syntax of following commands

UPDATE,DELETE

Pattern matchings Operators & Wildcards:-LIKE,%,Underscore(_),NOT LIKE, Range of characters[ ],Negate Range of characters[^]

Experiment No: 4

DQL COMMANDS

1. Retrieve the names of all instructors along with department names

2. Retrieve the semester names from **teaches** relation and avoid duplicates.

3. Retrieve the name of instructor along with 10% raise in their salary

4. Retrieve the id and name of instructor whose salary is greater than 70000 and working under computer science department

5. Retrieve the names of all instructors along with their department names and department building names

6. Retrieve the instructor names and course identifiers for instructors in the computer science department
7. Retrieve the details of course for which title starts with ‘Intro’
8. Retrieve the details of course in which title contains the substring ‘Comp’
9. Retrieve the information of students who have exactly 3 characters in their names
10. Retrieve the information of Instructors who have at least 3 characters in their names

Viva Topics:

Syntax of select from where basic clause
What are aliases? Explain with an example
Syntax of rename operator
Subquery with example

Experiment No: 5

TCL COMMANDS

1. Change the name of the student with id 44553 as john
2. Commit all the operations
3. Change the name of the student with id 44553 as ‘Peltier’
4. Rollback all the operations
5. Insert a new row into a table student, make 3 updates to the new row and after 2 updates set savepoints.

6. Rollback to each savepoint

Viva Topics:

ACID properties

Difference between commit, abort and rollback

Which command is used to remove a savepoint?

Syntax of rollback and savepoint

Experiment No: 6

DCL COMMANDS

1. Give select permission to all users for a table that you created already

2. Give all permission to all users for a table that you created already

3. Retrieve all the permissions that you are given

Viva Topics:

Syntax of grant and revoke

Use of grant and revoke

what is the role of a DBA?

Experiment No: 7

VIEWS AND ASSERTIONS

1. Create a view named ‘year wise’ from table section which shows the details for the courses on 2009
2. Create a view named ‘studentlist’ from table student which shows the details of students in alphabetical order
3. Create a view named ‘teacher’ which shows the details of teacher who are not taking any class
4. Insert a new row into view studentlist and update the name of student as ‘saviour’ to the new row
5. Delete the new row added to the view studentlist
6. Drop all the views created

Viva topics:

Compare assertion and trigger

How to create a view?

Compare view and table

How to use assertion in SQL?

Experiment No: 8

BUILT IN FUNCTIONS

1. Evaluate the following using Built in functions
   a. Cos(absolute(-10))* e^2) ,print the rounded value
   b. $Log_{10}(\sqrt{((5\text{^}4)\%14)})$, print the result as 2 digit in decimal part
   c. Sin(30)+tan(60), also print the sign of the result

2. Find the greatest preceding or the least succeeding integer of 12.9

3. Display Name of instructor as Uppercase, lowercase letters, and also shows as first letter in capital in separate columns

4. Replace the '-' in Course_id with '/' and display it as new column
5. Display the name of instructor with department name as full name
6. Display the last 3 numbers from course id

Viva Topics:

Syntax of: replace, substr, concat

Use of initcap

Difference between floor and ceil

What is dual table

Experiment No: 9

AGGREGATE FUNCTIONS

1. Find the sum of the salaries of all instructors, the maximum salary, the minimum salary, and the average salary.
2. Find the sum of the salaries of all instructors of the 'History' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
3. Retrieve the total number of instructors in the institution
4. Retrieve the total number of instructors in the 'Computer science' department
5. Count the number of distinct salary values in the database.

Viva Topics

What are aggregate functions, explain with syntax?

What is Normalization?

What are the various forms of Normalization?

Experiment No: 10

HAVING AND GROUP BY

1. For each department, retrieve the department name, the number of instructors in the department, and their average salary.
2. For each course, retrieve the course_id, the semester, and the number of students who takes that course.
3. For each course on which more than two students taken, retrieve the course_id, the semester, and the number of students who takes that course.

4. For each course, retrieve the course_id, the instructor name, and the number of courses taken from each department
5. For each department that has more than two instructors, retrieve the department name and the number of its instructors who are making more than $80,000.

Viva Topics

Significance of groupby having

Write a query to get dept and dept wise total salary from employee table

What is the use of having clause in group by

Difference between where clause and having clause

EXPERIMENT NO: 11

PL/SQL

1. Write a PL SQL program which assigns a message and display it.
2. Write a PL SQL conditional statement program for Grading system
3. Using Varray write a PL SQL program to find total marks of each of 5 students in 2 subject
4. Using While loop write a PL SQL program to find factorial of any number
5. Using simple loop write a PL SQL program to display multiplication table of 3 upto 10
6. Write a PLSQL program to find the odd and even numbers between 1 to 10 and insert it into a table and display it.

7. Write a PL/SQL block to find the square and cube of first 10 numbers and insert these values into a table
8. Write a PL/SQL block to accept cid and update Emi to half of its original value and display appropriate message based on the existence of the record in customer table

EXPERIMENT NO: 12

PROCEDURE AND FUNCTIONS

1. Create a procedure to find the minimum of two numbers
2. Create a procedure to convert a user input binary number to its decimal number
3. Create a procedure to find roots of a quadratic equation
4. Using procedure increment the salary with 20 percent for the staff whose id is given by user.
5. Using procedure delete the entry from staff table whose id is given by user.
6. Create a function to find the factorial of n numbers

7. Create a function to find the reverse of a given number and also check whether the number is palindrome or not
8. Create a function to check the given number is Armstrong or not
9. Create a function to find sum of n natural numbers and also insert it into a table having attributes number and sum
10. Create a function to find square root and cube root of a given number and then insert it into table having attributes number, square root and cube root

EXPERIMENT NO:13

PACKAGES

1. Create a package with following functions or procedures
    a. Write a procedure to find the area of circle of given radius.
    b. Write a procedure to find the area of a right-angled triangle
    c. Write a function to find the area of a triangle by giving a,b,c.
    d. Write a function to find the volume of cylinder.

3. Create a package in oracle which contains procedure or function to do the following

   a. Factorial of a given number

   b. To find the square of a given number.

   c. To find the nth term of the Fibonacci series

   d. To check whether the given number is prime or not.

EXPERIMENT NO:14

TRIGGERS AND CURSORS

1. Write a trigger on the Course table which shows the old values and new values of credits after any updations on credits on Course table.
2. Write a trigger to insert the old and new values of salary in the Instructor table into a new table when the Instructor table is updated and salary difference should be displayed.
3. Write a trigger to ensure that no course of credits less than 3 can be inserted in the Course table.

4. Write a trigger to ensure that no row with year 2009 and semester Fall can be deleted from the Takes table.

5. Delete all the triggers created.

6. Write a PL/SQL program to create a cursor that displays the name, department and salary of each instructor in the INSTRUCTOR table whose salary is less than that specified by a passed-in parameter value.

7. Write a PL/SQL program to create a cursor that displays the department name, number of instructors and number of courses listed in each department.

8. Write a PL/SQL program to display instructor id, name and salary of 5 highest paid instructors using cursor.

9. Write a PL/SQL program to increase salary of instructors in department specified by a parameter using cursor. The salary increase is 20% for instructors making less than 80,000 and 12% for the employees making 80,000 or more.

10. Write a PL/SQL program to create a cursor that displays all rows in Takes relation with grade 'A' and display the total number of rows.