



**COURSE PLAN**

|                                  |  |
|----------------------------------|--|
| <b>Department</b>                | : COMPUTER APPLICATIONS                        |
| <b>Course Name &amp; code</b>    | : Database Management System Lab<br>& MCA 4161 |
| <b>Semester &amp; branch</b>     | : 1st Semester, M.C.A                          |
| <b>Name of the faculty</b>       | : Vinayak Mantoor & Archana. H                 |
| <b>No. of contact hours/week</b> | : 3 hours/week                                 |

|                              |  |
|------------------------------|--|
| <b>Continuous Evaluation</b> | <b>60%</b>   |
| <b>Three Evaluations</b>     | Each of 20 marks-obs(5)+Exe(5)+Test(10)<br><br><b>Max.Marks:60</b>   |
| <b>Lab Examination</b>       | <b>40%</b>   |
|                              | Examination of 3 hours duration that<br>includes questions based on:<br><br>SQL+PL/SQL<br><br>Max.Marks:40 |

**INSTRUCTIONS TO STUDENTS**

1. Students should be regular and come prepared for the lab practice.
2. In case a student misses a class, it is his/her responsibility to complete that missed exercise(s).
3. Students should bring the observation book daily for the lab.
4. They should implement the given query/program individually.
5. Students should clearly listen to the instructions given by the faculty.
6. Once the query/program gets executed, they should show the query/program and results to the instructors and copy the same in their observation book.
7. When copying down the query in the observation book the template to be followed is:
  - a. Question No
  - b. Question
  - c. Query statement

- d. Output
- 8. When copying down the PL/SQL program in the observation book the template to be followed is:
  - a. Program No
  - b. Program title
  - c. Program Code
  - d. Output
- 9. Questions for lab tests and exam need not necessarily be limited to the questions in the manual, but could involve some variations and / or combinations of the questions.

## CONTENTS

| Week       | Topics to be covered  |
|------------|---|
| <b>1-2</b> | SQL Basics – CREATE, ALTER, DROP                                  |
| <b>3</b>   | Populate and manipulate the database using INSERT, UPDATE, DELETE |
| <b>4-6</b> | SQL Simple and Advanced Queries                                   |
| <b>7</b>   | PL/SQL  |
| <b>8</b>   | Cursors   |
| <b>9</b>   | Exception Handling  |
| <b>10</b>  | Triggers  |
| <b>11</b>  | Procedures, Functions, Packages                                   |
| <b>12</b>  | <b>End Term Practical Examination</b>                             |

## Course Outcomes (COs)

*At the end of this course, the student should be able to:*

|             |   | No. of Contact Hours |
|-------------|---|----------------------|
| <b>C01:</b> | Create and modify database objects  | 6                    |
| <b>C02:</b> | Manipulate the data in the database                                       | 3                    |
| <b>C03:</b> | Design queries to retrieve the data from database                         | 9                    |
| <b>C04:</b> | Perform database operations by integrating procedural language constructs | 9                    |
| <b>C05:</b> | Design stored programs  | 6                    |

## Course Plan

| L. No.     | Topics  | CO                                       |                                    |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
|------------|---|--|------------------------------------|------------|-----------------|-------|-----------|--------------------------|--|-------|--------------|--|--|-----|-------------|------------------------|--------------|-------|-----------|----------------|-------------------|------------|------|--------------------------------|---------------------|-----|-------------|-----------------|------------------|------|-------------|--------------|--|--------|-------------|--|---------------------|-----------|------|--|--|-----------|------|------------|-----------------|-----|-------------|----------------------------|------------------------------------|-------|--------------|--------|----------------|----------|-------------|---------------------|----------------|-----|
| L1, L2     | <p>1.1 Create the tables with the following columns and constraints with given constraint names:<br/><b><u>EMP</u></b></p> <table><tr><th>Attribute</th><th>Type</th><th>Constraint</th><th>Constraint Name</th></tr><tr><td>EMPNO</td><td>NUMBER(4)</td><td>Make this as primary key</td><td></td></tr><tr><td>ENAME</td><td>VARCHAR2(10)</td><td></td><td></td></tr><tr><td>JOB</td><td>VARCHAR2(9)</td><td>CLRK/MGR/A.MGR/GM/CEO,</td><td>JOB_CHK_Cons</td></tr><tr><td>MGRID</td><td>NUMBER(4)</td><td>References EMP</td><td>MGR_FK_EMPNO_Cons</td></tr><tr><td>DATE_BIRTH</td><td>DATE</td><td>Must be less than joining Date</td><td>DB_Less_DBJOIN_Cons</td></tr><tr><td>SAL</td><td>NUMBER(7,2)</td><td>More than 20000</td><td>SAL_20KMore_Cons</td></tr><tr><td>COMM</td><td>NUMBER(7,2)</td><td>DEFAULT 1000</td><td></td></tr><tr><td>DEPTNO</td><td>VARCHAR2(3)</td><td>References DEPT and<br/>ON DELETE CASCADE</td><td>DEPTNO_FK_DEPT_Cons</td></tr><tr><td>DATE_JOIN</td><td>DATE</td><td></td><td></td></tr></table> <p><b><u>DEPT</u></b></p> <table><tr><th>Attribute</th><th>Type</th><th>Constraint</th><th>Constraint Name</th></tr><tr><td>DNO</td><td>VARCHAR2(3)</td><td>UNIQUE and Starts from 'D'</td><td>DNO_UNQ_Cons and<br/>D-LikeDNO_Cons</td></tr><tr><td>DNAME</td><td>VARCHAR2(10)</td><td>Unique</td><td>DNAME_UNQ_Cons</td></tr><tr><td>LOCATION</td><td>VARCHAR2(9)</td><td>BNG/MNG/MUB/HYD/CHN</td><td>VALID_LOC_Cons</td></tr></table> | Attribute                                | Type                               | Constraint | Constraint Name | EMPNO | NUMBER(4) | Make this as primary key |  | ENAME | VARCHAR2(10) |  |  | JOB | VARCHAR2(9) | CLRK/MGR/A.MGR/GM/CEO, | JOB_CHK_Cons | MGRID | NUMBER(4) | References EMP | MGR_FK_EMPNO_Cons | DATE_BIRTH | DATE | Must be less than joining Date | DB_Less_DBJOIN_Cons | SAL | NUMBER(7,2) | More than 20000 | SAL_20KMore_Cons | COMM | NUMBER(7,2) | DEFAULT 1000 |  | DEPTNO | VARCHAR2(3) | References DEPT and<br>ON DELETE CASCADE | DEPTNO_FK_DEPT_Cons | DATE_JOIN | DATE |  |  | Attribute | Type | Constraint | Constraint Name | DNO | VARCHAR2(3) | UNIQUE and Starts from 'D' | DNO_UNQ_Cons and<br>D-LikeDNO_Cons | DNAME | VARCHAR2(10) | Unique | DNAME_UNQ_Cons | LOCATION | VARCHAR2(9) | BNG/MNG/MUB/HYD/CHN | VALID_LOC_Cons | CO1 |
| Attribute  | Type  | Constraint                               | Constraint Name                    |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| EMPNO      | NUMBER(4)   | Make this as primary key                 |                                    |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| ENAME      | VARCHAR2(10)  |  |                                    |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| JOB        | VARCHAR2(9)   | CLRK/MGR/A.MGR/GM/CEO,                   | JOB_CHK_Cons                       |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| MGRID      | NUMBER(4)   | References EMP                           | MGR_FK_EMPNO_Cons                  |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| DATE_BIRTH | DATE  | Must be less than joining Date           | DB_Less_DBJOIN_Cons                |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| SAL        | NUMBER(7,2)   | More than 20000                          | SAL_20KMore_Cons                   |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| COMM       | NUMBER(7,2)   | DEFAULT 1000                             |                                    |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| DEPTNO     | VARCHAR2(3)   | References DEPT and<br>ON DELETE CASCADE | DEPTNO_FK_DEPT_Cons                |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| DATE_JOIN  | DATE  |  |                                    |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| Attribute  | Type  | Constraint                               | Constraint Name                    |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| DNO        | VARCHAR2(3)   | UNIQUE and Starts from 'D'               | DNO_UNQ_Cons and<br>D-LikeDNO_Cons |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| DNAME      | VARCHAR2(10)  | Unique                                   | DNAME_UNQ_Cons                     |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |
| LOCATION   | VARCHAR2(9)   | BNG/MNG/MUB/HYD/CHN                      | VALID_LOC_Cons                     |            |                 |       |           |                          |  |       |              |  |  |     |             |                        |              |       |           |                |                   |            |      |                                |                     |     |             |                 |                  |      |             |              |  |        |             |  |                     |           |      |  |  |           |      |            |                 |     |             |                            |                                    |       |              |        |                |          |             |                     |                |     |

| L. No.     | Topics   | CO                         |                       |            |                 |            |             |                           |                  |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
|------------|--|----------------------------|-----------------------|------------|-----------------|------------|-------------|---------------------------|------------------|--------|-------------|----------------------------|------------------|----------|--------------|------------|-------|------------|-----------|--------------------|-----------------------|-----------|---------|------|-----|------------|-------|-----------------------|-----------------------|----|------------|-----|-------|----|-----|------------|-------|-------|------|------|-----------|-----|--|-----|------|------------|-------|-------|------|------|-----------|-----|--|--------|-----|------------|--|--|----|----|-----------|-----|--|------|-----|-----------|--|--|----|----|-----------|-----|------|-------|-----|------------|--|--|----|----|-----------|-----|--|-------|-----|-----------|--|--|----|----|-----------|-----|--|-----|-----|-----------|--|--|----|--|-----------|-----|--------|------|-----|------------|-------|--|----|----|-----------|-----|--|------|-----|------------|--|--|----|--|-----------|-----|--|------|-----|------------|--|--|----|----|-----------|------|--|------|-----|------------|-------|--|----|--|------------|-----|
|            | <p><b>PROJ</b></p> <table><tr><th>Attribute</th><th>Type</th><th>Constraint</th><th>Constraint Name</th></tr><tr><td>DNO</td><td>VARCHAR2(3)</td><td>References DEPT ,NOT NULL</td><td>DNO_FK_DEPT_Cons</td></tr><tr><td>PRJ_NO</td><td>VARCHAR2(5)</td><td>Starts from 'P' , NOT NULL</td><td>P-LikePRJNO_Cons</td></tr><tr><td>PRJ_NAME</td><td>VARCHAR2(10)</td><td></td><td></td></tr><tr><td>PRJ_CREDIT</td><td>NUMBER(2)</td><td>Range from 1 to 10</td><td>PRJ_CREDIT_RANGE_Cons</td></tr><tr><td>STRT_DATE</td><td>DATE</td><td></td><td></td></tr><tr><td>END_DATE</td><td>DATE</td><td>END_DATE &gt; START_DATE</td><td>ENDDATE_GRT_STRT_Cons</td></tr></table> <p>2.1 Make the combination of <b>DNO</b> and <b>PRJ_NO</b> as primary key in the table PROJ.</p> <p>2.2 Add a column to EMP table named <b>PRJ_ID</b>. Add a foreign key constraint to EMP table on (<b>DeptNo, Proj_Id</b>) referencing <b>PROJ</b>. (Indicates an employee from which department is working on which project/s.)</p> <p>2.3 Add constraints(VALID_EMPNO_Cons) to the EMP table to check the EMPNO &gt;100.</p> <p>2.4 Add a new column <b>Dept_Budget</b> column of size 7 digits to the DEPT table.</p> <p>2.5 Add a new column <b>Prj_Fund</b> column of size 7 digits to the PROJ table.</p>   | Attribute                  | Type                  | Constraint | Constraint Name | DNO        | VARCHAR2(3) | References DEPT ,NOT NULL | DNO_FK_DEPT_Cons | PRJ_NO | VARCHAR2(5) | Starts from 'P' , NOT NULL | P-LikePRJNO_Cons | PRJ_NAME | VARCHAR2(10) |            |       | PRJ_CREDIT | NUMBER(2) | Range from 1 to 10 | PRJ_CREDIT_RANGE_Cons | STRT_DATE | DATE    |      |     | END_DATE   | DATE  | END_DATE > START_DATE | ENDDATE_GRT_STRT_Cons |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| Attribute  | Type   | Constraint                 | Constraint Name       |            |                 |            |             |                           |                  |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| DNO        | VARCHAR2(3)  | References DEPT ,NOT NULL  | DNO_FK_DEPT_Cons      |            |                 |            |             |                           |                  |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| PRJ_NO     | VARCHAR2(5)  | Starts from 'P' , NOT NULL | P-LikePRJNO_Cons      |            |                 |            |             |                           |                  |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| PRJ_NAME   | VARCHAR2(10)   |                            |                       |            |                 |            |             |                           |                  |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| PRJ_CREDIT | NUMBER(2)  | Range from 1 to 10         | PRJ_CREDIT_RANGE_Cons |            |                 |            |             |                           |                  |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| STRT_DATE  | DATE   |                            |                       |            |                 |            |             |                           |                  |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| END_DATE   | DATE   | END_DATE > START_DATE      | ENDDATE_GRT_STRT_Cons |            |                 |            |             |                           |                  |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| L3         | <p><b>Note:</b> Insert records into the following tables.</p> <ul style="list-style-type: none"><li>Student can enter a valid value into the columns left blank, columns with <i>null</i> must be entered with NULL value only.</li><li>If some records cannot be inserted because of violation of constraints, then write the reason for violation in the lab book and choose a data satisfying the constraint and insert them into the table.</li><li>Insert 2 records of your own.</li></ul> <p><b>3.1 EMP table data.</b></p> <p><b>3.1.1</b> MgRID values can't be inserted using INSERT, write the reason and solution.</p> <table><tr><th>Empno</th><th>Ename</th><th>Job</th><th>MgRID</th><th>Date_Birth</th><th>Sal</th><th>comm</th><th>Deptno</th><th>Prj_Id</th><th>Date join</th></tr><tr><td>100</td><td>Ravi</td><td>MGR</td><td>111</td><td>10-10-1985</td><td>32000</td><td></td><td>D1</td><td>P1</td><td>2-10-2001</td></tr><tr><td>102</td><td>Raviraj</td><td>CLRK</td><td>106</td><td>10-12-1980</td><td>24000</td><td></td><td>D1</td><td>P3</td><td>12-11-2000</td></tr><tr><td>111</td><td>Raghu</td><td>GM</td><td>150</td><td>10-12-1974</td><td>45000</td><td>15000</td><td>null</td><td>null</td><td>3-12-1985</td></tr><tr><td>150</td><td></td><td>CEO</td><td>null</td><td>10-12-1970</td><td>60000</td><td>30000</td><td>null</td><td>null</td><td>3-12-1990</td></tr><tr><td>103</td><td></td><td>A.CLRK</td><td>111</td><td>10-12-1980</td><td></td><td></td><td>D1</td><td>P1</td><td>2-10-2001</td></tr><tr><td>103</td><td></td><td>CLRK</td><td>111</td><td>2-10-1980</td><td></td><td></td><td>D1</td><td>P3</td><td>2-10-2002</td></tr><tr><td>125</td><td>Manu</td><td>A.MGR</td><td>150</td><td>10-12-1980</td><td></td><td></td><td>D4</td><td>P2</td><td>2-10-2002</td></tr><tr><td>104</td><td></td><td>CLERK</td><td>125</td><td>2-10-1980</td><td></td><td></td><td>D2</td><td>P1</td><td>2-10-2005</td></tr><tr><td>106</td><td></td><td>MGR</td><td>111</td><td>2-10-1986</td><td></td><td></td><td>D2</td><td></td><td>2-10-1985</td></tr><tr><td>123</td><td>Mahesh</td><td>CLRK</td><td>150</td><td>10-12-1974</td><td>25000</td><td></td><td>D3</td><td>P2</td><td>2-10-2002</td></tr><tr><td>108</td><td></td><td>CLRK</td><td>106</td><td>10-12-1970</td><td></td><td></td><td>D9</td><td></td><td>2-10-1985</td></tr><tr><td>103</td><td></td><td>CLRK</td><td>111</td><td>10-12-1980</td><td></td><td></td><td>D1</td><td>P3</td><td>2-10-2001</td></tr><tr><td>null</td><td></td><td>CLRK</td><td>106</td><td>10-12-1980</td><td>18000</td><td></td><td>D5</td><td></td><td>10-12-1980</td></tr></table> | Empno                      | Ename                 | Job        | MgRID           | Date_Birth | Sal         | comm                      | Deptno           | Prj_Id | Date join   | 100                        | Ravi             | MGR      | 111          | 10-10-1985 | 32000 |            | D1        | P1                 | 2-10-2001             | 102       | Raviraj | CLRK | 106 | 10-12-1980 | 24000 |                       | D1                    | P3 | 12-11-2000 | 111 | Raghu | GM | 150 | 10-12-1974 | 45000 | 15000 | null | null | 3-12-1985 | 150 |  | CEO | null | 10-12-1970 | 60000 | 30000 | null | null | 3-12-1990 | 103 |  | A.CLRK | 111 | 10-12-1980 |  |  | D1 | P1 | 2-10-2001 | 103 |  | CLRK | 111 | 2-10-1980 |  |  | D1 | P3 | 2-10-2002 | 125 | Manu | A.MGR | 150 | 10-12-1980 |  |  | D4 | P2 | 2-10-2002 | 104 |  | CLERK | 125 | 2-10-1980 |  |  | D2 | P1 | 2-10-2005 | 106 |  | MGR | 111 | 2-10-1986 |  |  | D2 |  | 2-10-1985 | 123 | Mahesh | CLRK | 150 | 10-12-1974 | 25000 |  | D3 | P2 | 2-10-2002 | 108 |  | CLRK | 106 | 10-12-1970 |  |  | D9 |  | 2-10-1985 | 103 |  | CLRK | 111 | 10-12-1980 |  |  | D1 | P3 | 2-10-2001 | null |  | CLRK | 106 | 10-12-1980 | 18000 |  | D5 |  | 10-12-1980 | CO2 |
| Empno      | Ename  | Job                        | MgRID                 | Date_Birth | Sal             | comm       | Deptno      | Prj_Id                    | Date join        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 100        | Ravi   | MGR                        | 111                   | 10-10-1985 | 32000           |            | D1          | P1                        | 2-10-2001        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 102        | Raviraj  | CLRK                       | 106                   | 10-12-1980 | 24000           |            | D1          | P3                        | 12-11-2000       |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 111        | Raghu  | GM                         | 150                   | 10-12-1974 | 45000           | 15000      | null        | null                      | 3-12-1985        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 150        |  | CEO                        | null                  | 10-12-1970 | 60000           | 30000      | null        | null                      | 3-12-1990        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 103        |  | A.CLRK                     | 111                   | 10-12-1980 |                 |            | D1          | P1                        | 2-10-2001        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 103        |  | CLRK                       | 111                   | 2-10-1980  |                 |            | D1          | P3                        | 2-10-2002        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 125        | Manu   | A.MGR                      | 150                   | 10-12-1980 |                 |            | D4          | P2                        | 2-10-2002        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 104        |  | CLERK                      | 125                   | 2-10-1980  |                 |            | D2          | P1                        | 2-10-2005        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 106        |  | MGR                        | 111                   | 2-10-1986  |                 |            | D2          |                           | 2-10-1985        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 123        | Mahesh   | CLRK                       | 150                   | 10-12-1974 | 25000           |            | D3          | P2                        | 2-10-2002        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 108        |  | CLRK                       | 106                   | 10-12-1970 |                 |            | D9          |                           | 2-10-1985        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| 103        |  | CLRK                       | 111                   | 10-12-1980 |                 |            | D1          | P3                        | 2-10-2001        |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |
| null       |  | CLRK                       | 106                   | 10-12-1980 | 18000           |            | D5          |                           | 10-12-1980       |        |             |                            |                  |          |              |            |       |            |           |                    |                       |           |         |      |     |            |       |                       |                       |    |            |     |       |    |     |            |       |       |      |      |           |     |  |     |      |            |       |       |      |      |           |     |  |        |     |            |  |  |    |    |           |     |  |      |     |           |  |  |    |    |           |     |      |       |     |            |  |  |    |    |           |     |  |       |     |           |  |  |    |    |           |     |  |     |     |           |  |  |    |  |           |     |        |      |     |            |       |  |    |    |           |     |  |      |     |            |  |  |    |  |           |     |  |      |     |            |  |  |    |    |           |      |  |      |     |            |       |  |    |  |            |     |

| L. No. | Topics  | CO       |             |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
|--------|---|----------|-------------|----------|-------------|----|-----------|-----|--------|----|----------|-----|--------|----|----|-----|--------|----|----|-----|--------|----|----------|-----|--------|------|-----------|-----|--------|-----|--------|----------|-------------|----------|----|----|--|---|--------|----|----|--|---|--------|----|----|--|---|--------|----|----|--|---|--------|----|----|--|---|--------|--|
|        | <p><b>3.2 DEPT</b> table data.</p> <table><tr><th>DNO</th><th>DName</th><th>Location</th><th>Dept_Budget</th></tr><tr><td>D1</td><td>Marketing</td><td>CHN</td><td>500000</td></tr><tr><td>D2</td><td>Research</td><td>MNG</td><td>300000</td></tr><tr><td>D3</td><td>IT</td><td>BNG</td><td>400000</td></tr><tr><td>D4</td><td>HR</td><td>BGG</td><td>200000</td></tr><tr><td>D5</td><td>Accounts</td><td>BNG</td><td>500000</td></tr><tr><td>Null</td><td>Corporate</td><td>HYD</td><td>700000</td></tr></table> <p><b>3.3 PROJ</b> table data.</p> <table><tr><th>Dno</th><th>Prj_No</th><th>Prj_Name</th><th>Prj_Credits</th><th>Prj_Fund</th></tr><tr><td>D1</td><td>P1</td><td></td><td>4</td><td>400000</td></tr><tr><td>D2</td><td>P1</td><td></td><td>2</td><td>200000</td></tr><tr><td>D3</td><td>P2</td><td></td><td>3</td><td>300000</td></tr><tr><td>D1</td><td>P3</td><td></td><td>5</td><td>500000</td></tr><tr><td>D4</td><td>P2</td><td></td><td>7</td><td>700000</td></tr></table> <p><b>Note:</b> Perform following activity and write the observation.</p> <p><b>3.4</b> Run <b>COMMIT</b> command. Delete the employee records working on project P3 and confirm the result. Type <b>ROLLBACK</b> to restore the records back if records are deleted.</p> <p><b>3.5</b> Run <b>COMMIT</b> command. Delete <i>Accounts</i> department from the DEPT table and confirm the result with reason. Type <b>ROLLBACK</b> to restore the records back if records are deleted.</p> <p><b>3.6</b> Run <b>COMMIT</b> command. Delete records of employees with Empno 125 and working in project P2. Type <b>ROLLBACK</b> to restore the records back, if records are deleted.</p> <p><b>3.7</b> Update the DNO of first record in PROJ to D5.</p> <p><b>3.8</b> Update the Job of employee with Empno 123 to MGR, salary to 35000 and his manager as 111.</p> <p><b>3.9</b> Update the EMP table to set the default commission of all employees to Rs.10000/- who are working as managers</p> | DNO      | DName       | Location | Dept_Budget | D1 | Marketing | CHN | 500000 | D2 | Research | MNG | 300000 | D3 | IT | BNG | 400000 | D4 | HR | BGG | 200000 | D5 | Accounts | BNG | 500000 | Null | Corporate | HYD | 700000 | Dno | Prj_No | Prj_Name | Prj_Credits | Prj_Fund | D1 | P1 |  | 4 | 400000 | D2 | P1 |  | 2 | 200000 | D3 | P2 |  | 3 | 300000 | D1 | P3 |  | 5 | 500000 | D4 | P2 |  | 7 | 700000 |  |
| DNO    | DName   | Location | Dept_Budget |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D1     | Marketing   | CHN      | 500000      |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D2     | Research  | MNG      | 300000      |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D3     | IT  | BNG      | 400000      |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D4     | HR  | BGG      | 200000      |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D5     | Accounts  | BNG      | 500000      |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| Null   | Corporate   | HYD      | 700000      |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| Dno    | Prj_No  | Prj_Name | Prj_Credits | Prj_Fund |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D1     | P1  |          | 4           | 400000   |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D2     | P1  |          | 2           | 200000   |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D3     | P2  |          | 3           | 300000   |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D1     | P3  |          | 5           | 500000   |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| D4     | P2  |          | 7           | 700000   |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |
| L4     | <p><b>4.1</b> Display all records from EMP, DEPT and PROJ table.</p> <p><b>4.2</b> Display records of Employees who have salary more than 25000 or working in department D1 .</p> <p><b>4.3</b> List all employee with their names and their salaries, whose salary lies between 25200/- and 35200/- both inclusive.</p> <p><b>4.4</b> List the name of employees who is working at Locations (BNG,MUB,HYD) (using both OR , IN operator).</p> <p><b>4.5</b> Display <i>department number</i> from the table <i>EMP</i> avoiding the duplicated values.</p>   | CO3      |             |          |             |    |           |     |        |    |          |     |        |    |    |     |        |    |    |     |        |    |          |     |        |      |           |     |        |     |        |          |             |          |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |    |    |  |   |        |  |

| L. No.    | Topics  | CO         |
|-----------|---|------------|
|           | <p><b>4.6</b> Display the records in the EMP table in the ascending order of Deptno and descending order of salary.</p> <p><b>4.7</b> Create a table <b>Manager</b> with columns Empno, Ename, Job, Deptno, Salary with structure and data copied from the <i>EMP</i> table.</p> <p><b>4.8</b> List the Project Number, Project Name of all the projects handled by the department D2 and having project credits more than 5.</p> <p><b>4.9</b> List all employees reporting to manager with <i>empno</i> 111.</p> <p><b>4.10</b> List all employees whose name starts with either <b>M</b> or <b>R</b> and name length is <b>6</b>.</p> <p><b>4.11</b> List the name of employees whose name do not start with <b>S</b>.</p> <p><b>4.12</b> Display name of employees whose 2<sup>nd</sup> &amp; 3<sup>rd</sup> character is '<b>av</b>' and ends with '<b>j</b>'.</p> <p><b>4.13</b> List out the employees who are not receiving commission.</p>   |            |
| <b>L5</b> | <p><b>5.1</b> List the minimum, maximum and average salaries and rename the column as min_sal, max_sal, avg_sal, total salary of the employees.</p> <p><b>5.2</b> List the Project names undertaken by <i>Marketing</i> Department.</p> <p><b>5.3</b> Display the employees name in capital, lower, 1<sup>st</sup> character only capital, number of characters and 3 characters from 2<sup>nd</sup> position.</p> <p><b>5.4</b> List the name of employees who are working under the manager 'Raghu'.</p> <p><b>5.5</b> Display department name, Max salary and Min salary in each department.</p> <p><b>5.6</b> Display number of employees working in each department and their department name.</p> <p><b>5.7</b> List the employees whose experience is more than 5 years.</p> <p><b>5.8</b> List the Employees who are born in the month of December.</p> <p><b>5.9</b> List the Employees who are born on a given year.</p> <p><b>5.10</b> Display the DOB of all employees in the format "<b>dd-mm-yy</b>".</p> <p><b>5.11</b> Write SQL query to illustrate ceiling, floor, truncate and round functions on the value 2.83.</p> <p><b>5.12</b> List the projects which have duration more than 1 year.</p> <p><b>5.13</b> Update the COMM column of EMP table based on the SAL. Use <i>COMM=COMM+SAL*10/100</i>.</p> | <b>CO3</b> |
| <b>L6</b> | <p><b>6.1</b> List Job category and total salary paid for the each jobs category by the company.</p> <p><b>6.2</b> Display name of the department from which maximum number of employees are working on project P1.</p> <p><b>6.3</b> Select name and job of employees working either in 'Marketing' or 'Research' department.</p> <p><b>6.4</b> Display name and salary of employees whose salary is greater than minimum salary of the company.</p> <p><b>6.5</b> Display the Deptno of the department that has highest average salary of the company.</p> <p><b>6.6</b> List the name of departments which are working on more than 1 project</p> <p><b>6.7</b> Write a query to list Employee number, name and Job of the employees who work in the same job as 'Mahesh'.</p> <p><b>6.8</b> Create a View EMP_PRJ_VW to display records of employees of 'marketing' department and project in which they are working.</p>   | <b>CO3</b> |

| L. No.    | Topics  | CO         |
|-----------|---|------------|
|           | <p><b>6.9</b> Display employee names and projects in which they are working using View EMP_PRJ_VW .</p> <p><b>6.10</b> List out the no.of employees joined in every month in ascending order.</p> <p><b>6.11</b> Create an index on the columns (name and job) on EMP table.</p>  |            |
| <b>L7</b> | <p><b>7.1</b> Write a PL/SQL block to find the sum of the digits of a given number.</p> <p><b>7.2</b> Write a PL/SQL block to check an input string is palindrome or not palindrome.</p> <p><b>7.3</b> Write a PL/SQL block to accept employee number and display Employee Name, Department name, salary of employees in the format – ‘RAVI works in <i>Marketing</i> department and draws 32000/- as salary’.</p> <p><b>7.4</b> Create a Table EMPSAL with fields-Empno, Empname, Sal, HRA, DA, Gross Salary, PF, Net Salary (assume appropriate datatype and size).<br/>Write a PL/SQL block to accept an employee number existing in EMP table and calculate HRA, DA, Gross Salary, PF, Net_Salary of that employee. Insert the empno, empname, Sal, HRA, DA, Gross Salary, PF, Net Salary into the table EMPSAL:<br/>Use the following formula to calculate salary components-<br/>HRA=50% of Sal<br/>DA=20% of Sal<br/>PF=12% of Sal.<br/>Gross_sal= Sal+ HRA+DA<br/>Net_Sal= Gross_sal-PF</p> <p><b>7.5</b> Write a PL/SQL block to calculate the area of a circle for a value of radius varying from 3 to 7. Store the Radius and the corresponding values of calculated Area in an empty table named CIRCLE, consisting of two columns radius &amp; area.</p> | <b>CO4</b> |
| <b>L8</b> | <p><b>8.1</b> Write a cursor to display ENAME and SAL of all employees drawing salary more than 30000/-.</p> <p><b>8.2</b> Write a cursor PL/SQL block to allocate incentives to employees and to the corresponding departments handling a project from the Prj_Fund reserved. According to the Prj_Credits a department is having on the Project, a portion of Prj_Fund is given to the department on that project. E.g. Credit is 2 , allocate 20%. Corresponding department has to share 70% of amount received among all employees who are working on that project equally. Remaining 30% is added to Dept_Budget.</p> <p><b>8.3</b> Write a parameterized cursor to display employee with the user given parameters- job and deptno ( Using Cursor for loop)</p> <p><b>8.4</b> Write a parameterized cursor to display first two highest paid employees details (Name, Salary, Department Name) working on a project. The Prj_Id is the user given parameter.</p>  | <b>CO4</b> |
| <b>L9</b> | <p><b>9.1</b> Write a PL/SQL program to demonstrate predefined exceptions- INVALID_NUMBER, TOO_MANY_ROWS, NO-DATA_FOUND. Do following operations in the PL/SQL block and handle pre-defined exceptions correspondingly by displaying proper messages.<br/>- Convert ename into number using to_number( ) function</p>   | <b>CO4</b> |

| L. No.     | Topics   | CO         |
|------------|--|------------|
|            | <ul style="list-style-type: none"> <li>- Display ename of employee corresponding to user entered empno. Handle exception if entered empno does not exists.</li> <li>- Display ename of employee corresponding to user entered deptno. Handle exception.</li> </ul> <p><b>9.2</b> Write a PL/SQL block to accept, Principle, Interest rate and duration (in years) to calculate Interest to be paid. Handle the exceptions if Principle <math>\leq 1000</math>, interest rate <math>&lt; 5</math>, year <math>&lt; 1</math> and display proper error message for each.</p> <p><b>9.3</b> Write a PL/SQL block to accept employee number from user and display employee details such as Empno, Name, and Sal. Handle the exception raised through user defined messages –</p> <p>(i) If user entered a non-existing employee number.</p> <p>(ii) If the salary more than 25000/-</p> <p>If employee exists and salary is less than 25000/- then update that salary to 25000/-</p>  |            |
| <b>L10</b> | <p><b>10.1</b> Write a PL/SQL trigger to fire when there is an updation of salary of any employee and record the Empno, Dept. Name and Old Salary, date on which salary is modified and user who modified information in the table SAL_MOD (Empno, Dname, Old_Sal, Mod_Date, Modifier).</p> <p><b>10.2</b> Write a trigger to be invoked when a department on a project updates Prj_fund by adding additional fund. Depending on project duration lapsed, display the message for additional fund for which department is eligible on that project. The project duration lapsed is calculated as difference between current_date (user entered) and start_date. Additional fund eligible is calculated according to the following criteria:<br/>If project duration lapsed is less than 50% then display- You are eligible for Rs. xxxx(xxxx is 70% of additional fund requested) else display- You are eligible for Rs.xxxx (xxxx is 40% of additional fund requested).</p> <p><b>10.3</b> Write a PL/SQL block trigger to do INSERT/UPDATE/DELETE operation only during week days. Raise an exception if the day is SAT or SUN and also display user who initiated operation</p> | <b>CO5</b> |
| <b>L11</b> | <p><b>11.1</b> Write a procedure to calculate simple interest, taking principle, rate and year as inputs.</p> <p><b>11.2</b> Write a procedure to take department name as input to display project being handled by the department and name of the employees working under those projects belonging to the department.</p> <p><b>11.3</b> Write two functions to calculate age and service experience of all employees and return these values to calling PL/SQL block and display.</p> <p><b>11.4</b> Write a function to find total project fund on different projects that every department has received. In main program call function for every deptno fetched from Dept. Display following message format for every deptno in main program- (use cursor)</p> <p style="text-align: center;"><b>Marketing</b> department has received Rs. <b>1600000/-</b></p> <p><b>11.5</b> Write a package containing procedure to find sum of salary of employees working in a given Department Name and a function to find number of employees working under a given Project Name.</p>   | <b>CO5</b> |



| L. No. | Topics                | CO |
|--------|-----------------------|----|
| L12    | END SEMESTER LAB EXAM |    |

### References

|  |
|--|
| 1. Ivan Bayross, “SQL, PL/SQL-The Programming Language of ORACLE”, 4 <sup>th</sup> Edition, BPB Publications,. |
| 2. Satish Asnani, “Oracle Database 11g”, PHI, 2010.  |
| 3. Scott Urman, “ORACLE – PL/SQL Programming”, Oracle Press.   |

**Submitted by:** Vinayak Mantoor & Archana.H

**(Signature of the faculty)**

**Date:** 10/09/2022

**Approved by:** Dr. Radhika M Pai

**(Signature of HOD)**

**Date:** 10/09/2022