COURSE PLAN

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

Continuous Evaluation	**60%**
THREE Evaluations	20 marks-obs(5)+Exe(5)+Test(10) 20 marks-obs(5)+Exe(5)+Test(10) 20 marks-obs(5)+Exe(5)+Test(10) **Max.Marks:60**
Lab Examination	**40%**
	Examination of 3 hours duration that includes questions based on: SQL(20 marks)+PL/SQL(20 marks) 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

Course Outcomes (COs)

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

		No. of Contact Hours
CO1:	Create and modify database objects	6
CO2:	Manipulate the data in the database	3
CO3:	Design queries to retrieve the data from database	3
CO4:	Perform database operations by integrating procedural language constructs and design stored programs	9
CO5:		

Course Plan

L. No.	Topics	CO
L1, L2	**1.1** Create the tables with the following columns and constraints with given constraint names: **EMP**	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 ON DELETE CASCADE	DEPTNO_FK_DEPT_Cons
DATE_JOIN	DATE		

DEPT

Attribute	Type	Constraint	Constraint Name
DNO	VARCHAR2(3)	UNIQUE and Starts from 'D'	DNO_UNQ_Cons and 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

PROJ

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

2.1 Make the combination of **DNO and PRJ_NO** as primary key in the table PROJ.

2.2 Add a column to EMP table named **PRJ_ID**. Add a foreign key constraint to EMP table on **(DeptNo, Proj_Id)** referencing **PROJ**. (Indicates an employee from which department is working on which project/s.)

2.3 Add constraints(VALID_EMPNO_Cons) to the EMP table to check the EMPNO >100.

2.4 Add a new column **Dept_Budget** column of size 7 digits to the DEPT table.

2.5 Add a new column **Prj_Fund** column of size 7 digits to the PROJ table.

L3 — **CO2**

Note: Insert records into the following tables.

- **Student can enter a valid value into the columns left blank, columns with *null* must be entered with NULL value only.**
- **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.**
- **Insert 2 records of your own**.

3.1 EMP table data.

3.1.1 MgRID values can't be inserted using INSERT, write the reason and solution.

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

3.2 DEPT table data.

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

3.3 PROJ table data.

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

Note: Perform following activity and write the observation.

3.4 Run **COMMIT** command. Delete the employee records working on project P3 and confirm the result. Type **ROLLBACK** to restore the records back if records are deleted.

3.5 Run **COMMIT** command. Delete *Accounts* department from the DEPT table and confirm the result with reason. Type **ROLLBACK** to restore the records back if records are deleted.

3.6 Run **COMMIT** command. Delete records of employees with Empno 125 and working in project P2. Type **ROLLBACK** to restore the records back, if records are deleted.

3.7 Update the DNO of first record in PROJ to D5.

3.8 Update the Job of employee with Empno 123 to MGR, salary to 35000 and his manager as 111.

3.9 Update the EMP table to set the default commission of all employees to Rs.10000/- who are working as managers

L4	**4.1** List all employee with their names and their salaries, whose salary lies between 25600/- and 35500/- both inclusive	**CO3**
	4.2 List the name of employees who is working at Locations (BNG,MUB,HYD) (using both OR , IN operator).	
	4.3 Display the records in the EMP table in the ascending order of Deptno and descending order of salary.	
	4.4 Create a table **Manager** with columns Empno, Ename, Job, Deptno, Salary with structure and data copied from the *EMP* table.	
	4.5 List all employees reporting to manager with *empno* 111.	

L. No.	Topics	CO
	4.6 Display name of employees whose 2nd & 3rd character is '**av**' and ends with '**j**'. **4.7** List the Project names undertaken by *Marketing* Department **4.8** Display the employees name in capital, lower, 1st character only capital, number of characters and 3 characters from 2nd position. **4.9** List the name of employees who are working under the manager 'Raghu' **4.10** List the employees whose experience is more than 4 years. **4.11** List the Employees who are born in the month of April **4.12** List Job category and total salary paid for the each jobs category by the company. **4.13** Display name of the department from which maximum number of employees are working on project P1. **4.14** Display name and salary of employees whose salary is greater than minimum salary of the company. **4.15** Write a query to list Employee number, name and Job of the employees who work in the same job as 'Mahesh'. **4.16** Create a View EMP_PRJ_VW to display records of employees of 'marketing' department and project in which they are working **4.17** Display employee names and projects in which they are working using View EMP_PRJ_VW .	
L5	**5.1** Write a PL/SQL block to accept employee number and display Employee Name, Department name, salary of employees in the format – '*RAVI* works in *Marketing* department and draws *32000*/- as salary' **5.2** Create a Table EMPSAL with fields-Empno, Empname, Sal, HRA, DA, Gross Salary, PF, Net Salary (assume appropriate datatype and size). 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: Use the following formula to calculate salary components- HRA=50% of Sal DA=20% of Sal PF=12% of Sal. Gross_sal= Sal+ HRA+DA Net_Sal= Gross_sal-PF **5.3** Write a cursor to display ENAME and SAL of all employees drawing salary more than 30000/-. **5.4** Write a parameterized cursor to display employee with the user given parameters- job and deptno (Using Cursor for loop) **5.5** 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.	**CO4**
L6	**6.1** 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 – **(i)** If user entered a non–existing employee number. No data found	**CO4**

L. No.	Topics	CO
	(ii) Display ename of employee corresponding to user entered deptno. Handle exception. TOO_MANY_ROWS **(iii)** If the salary more than 25000/- If employee exists and salary is less than 25000/- then update that salary to 25000/- **6.2** Write a 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). **6.3** 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	
L7	**7.1** Write a procedure to calculate simple interest, taking principle, rate and year as inputs. **7.2** 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. **7.3** 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) ***Marketing*** department has received Rs. ***1600000***/- **7.4** 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.	**CO4**
L8	**END SEMESTER LAB EXAM**	

References

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

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