Please make use of your own examples after understanding the concepts.

Exercise Number: 3

Title of the Exercise : IN BUILT FUNCTIONS

Date of the Exercise :

OBJECTIVE (AIM) OF THE EXPERIMENT

To perform inbuilt functions using DML command.

FACILITIES REQUIRED AND PROCEDURE

a) Facilities required to do the experiment:

Sl.No.	Facilities required	Quantity
1	System	1
2	Operating System	Windows
3	Front end	
4	Back end	Oracle11g

b) Procedure for doing the experiment:

Step no.	Details of the step
1	Function is a group of code that accepts zero or more arguments and both return one or more results. Both are used to manipulate individual data items. Operators differ from functional in that they follow the format of function name (arg..). An argument is a user defined variables or constants. Most operators accept at most 2 arguments while the structure of functions permit to accept 3 or more arguments. Function can be classifies into **single row function and group functions**.
2	**Single Row functions** A single row function or scalar function returns only one value for every row queries in table. Single row function can appear in a select command and can also be included in a where clause. The single row function can be broadly classified as, o Date Function o Numeric Function o Character Function o Conversion Function o Miscellaneous Function The example that follows mostly uses the symbol table "**dual**". It is a table, which is automatically created by oracle along with the data dictionary.
3	**Date Function** They operate on date values and produce outputs, which also belong to date data type except for months, between, date function returns a number.
4	**Group Functions** A group function returns a result based on group of rows

c) SQL Commands:

DATE FUNCTION

1. Add_month

This function returns a date after adding a specified date with specified number of months.

Syntax: Add_months(d,n); where d-date n-number of months

Example: Select add_months(sysdate,2) from dual;

2. last_day

It displays the last date of that month.

Syntax: last_day (d); where d-date

Example: Select last_day ('1-jun-2009') from dual;

3. Months_between

It gives the difference in number of months between d1 & d2.

Syntax: month_between (d1,d2); where d1 & d2 -dates

Example: Select month_between ('1-jun-2009','1-aug-2009') from dual;

4. next_day

It returns a day followed the specified date.

Syntax: next_day (d,day);

Example: Select next_day (sysdate,'wednesday') from dual

5. round

This function returns the date, which is rounded to the unit specified by the format model.

Syntax : round (d,[fmt]);

where d- date, [fmt] – optional. By default date will be rounded to the nearest day

Example: Select round (to_date('1-jun-2009','dd-mm-yy'),'year') from dual;

Select round ('1-jun-2009','year') from dual;

NUMERICAL FUNCTIONS

Command	Query	Output
Abs(n)	Select abs(-15) from dual;	15
Ceil(n)	Select ceil(55.67) from dual;	56
Exp(n)	Select exp(4) from dual;	54.59
Floor(n)	Select floor(100.2) from dual;	100
Power(m,n)	Select power(4,2) from dual;	16
Mod(m,n)	Select mod(10,3) from dual;	1
Round(m,n)	Select round(100.256,2) from dual;	100.26
Trunc(m,n)	Select trunc(100.256,2) from dual;	100.23
Sqrt(m,n)	Select sqrt(16) from dual;	4

CHARACTER FUNCTIONS

Command	Query	Output
initcap(char);	select initcap("hello") from dual;	Hello
lower (char);	select lower ('HELLO') from dual;	hello
upper (char);	select upper ('hello') from dual;	HELLO
ltrim (char,[set]);	select ltrim ('cseit', 'cse') from dual; select	it
rtrim (char,[set]);	rtrim ('cseit', 'it') from dual;	cse
replace (char,search string, replace string);	select replace('jack and jue','j','bl') from dual;	black and blue
substr (char,m,n);	select substr ('information', 3, 4) from dual;	Form

CONVERSION FUNCTION

1. to_char()

Syntax: to_char(d,[format]);

This function converts date to a value of varchar type in a form specified by date format.

If format is negelected then it converts date to varchar2 in the default date format.

Example: select to_char (sysdate, 'dd-mm-yy') from dual;

2. to_date()

Syntax: to_date(d,[format]);

This function converts character to date data format specified in the form character.

Example: select to_date('aug 15 2009','mm-dd-yy') from dual;

Miscellaneous Functions

1. uid – This function returns the integer value (id) corresponding to the user currently logged in.

Example: select uid from dual;

2. user – This function returns the logins user name.

Example: select user from dual;

3. nvl – The null value function is mainly used in the case where we want to consider null values as zero.

Syntax; nvl(exp1, exp2)

If exp1 is null, return exp2. If exp1 is not null, return exp1.

Example: select custid, shipdate, nvl(total,0) from order;

4. vsize: It returns the number of bytes in expression.

Example: select vsize('tech') from dual;

GROUP FUNCTIONS

A group function returns a result based on group of rows.

1. avg - Example: select avg (total) from student;

2. max - Example: select max (percentagel) from student;

2.min - Example: select min (marksl) from student;

4. sum - Example: select sum(price) from product;

COUNT FUNCTION

In order to count the number of rows, count function is used.

1. count(*) – It counts all, inclusive of duplicates and nulls.

Example: select count(*) from student;

2. count(col_name)– It avoids null value.

Example: select count(total) from order;

2. count(distinct col_name) – It avoids the repeated and null values.

Example: select count(distinct ordid) from order;

GROUP BY CLAUSE

This allows us to use simultaneous column name and group functions.

Example: Select max(percentage), deptname from student group by deptname;

HAVING CLAUSE

This is used to specify conditions on rows retrieved by using group by clause.

Example: Select max(percentage), deptname from student group by deptname having count(*)>=50;

SPECIAL OPERATORS:

In / not in – used to select a equi from a specific set of values

Any - used to compare with a specific set of values

Between / not between – used to find between the ranges

Like / not like – used to do the pattern matching

d) Queries:

Q1: **Display all the details of the records whose employee name starts with 'A'.**

Solution:

1. Use SELECT FROM WHERE syntax. 2. select should include all in the given format.

3. from should include employee 4. where should include condition on empname like 'A%'.

Ans:

```
SQL> select * from emp where ename like 'A%';
     EMPNO ENAME              JOB              DEPTNO       SAL
---------- -------------------- ------------- ---------- ----------
         2 Arjun                ASP                  2      15000
         5 Akalya               AP                   1      10000
```

Q2: Display all the details of the records whose employee name does not starts with 'A'.

Ans:

SQL> select * from emp where ename not like 'A%';

```
 EMPNO ENAME            JOB            DEPTNO       SAL
---------- -------------------- ------------- ---------- ----------
         1 Mathi              AP                1     10000
         3 Gugan               ASP                1     15000
         4 Karthik            Prof              2     30000
```

Q3: Display the rows whose salary ranges from 15000 to 30000.

Ans:

```
SQL> select * from emp where sal between 15000 and 30000;

    EMPNO ENAME            JOB            DEPTNO       SAL
---------- -------------------- ------------- ---------- ----------
         2 Arjun              ASP               2     15000
         3 Gugan               ASP                1     15000
         4 Karthik            Prof              2     30000
```

Q4: Calculate the total and average salary amount of the emp table.

Ans:

```
SQL> select sum(sal),avg(sal) from emp;
  SUM(SAL)   AVG(SAL)
---------- ----------
     80000      16000
```

Q5: **Count the total records in the emp table.**

Ans:

```
  SQL>select * from emp;
 EMPNO ENAME            JOB            DEPTNO       SAL
------ -------------------- ------------- ---------- ----------
     1 Mathi              AP                1     10000
     2 Arjun               ASP                2     15000
     3 Gugan               ASP                1     15000
     4 Karthik            Prof              2     30000
     5 Akalya             AP                1     10000

SQL> select count(*) from emp;
  COUNT(*)
---------
         5
```

Q6: Determine the max and min salary and rename the column as max_salary and min_salary.

Solution:

1. Use the MIN & MAX aggregate function in select clause.
2. Rename the column as min_sal & max_sal.

Ans:

```
SQL> select max(sal) as max_salary, min(sal) as min_salary from emp;
MAX_SALARY MIN_SALARY
---------- ----------
     30000      10000
```

Q7: Display the month between "1-jun-10"and 1-aug-10 in full.

Ans:

```
SQL>Select month_between ('1-jun-2010','1-aug-2010') from dual;
```

Q8: Display the last day of that month in "05-Oct-09".

Ans:

```
SQL> Select last_day ('1-jun-2009') from dual;
LAST_DAY(
---------
30-JUN-09
```

Q9: Find how many job titles are available in employee table.

Solution:

1. Use select from clause.
2. Use count function to get the result.

Ans:

```
SQL> select count(job) from emp;
COUNT(JOB)
----------
         4
SQL> select count(distinct job) from emp;
COUNT(DISTINCTJOB)
------------------
                 2
```

Q10: What is the difference between maximum and minimum salaries of employees in the organization?

Solution:

1. Use select from clause.
2. Use function max(),min() and find the difference between them to get the result.

Ans:

```
SQL> select max(sal), min(sal) from emp;
MAX(SAL)   MIN(SAL)
---------- ----------
    20000      10000
```

d) Result:

Thus the nested Queries and join Queries was performed successfully and executed.

QUESTIONS AND ANSWERS

1. **Define function?**

   Function is a group of code that accepts zero or more arguments and both return one or more results. Both are used to manipulate individual data items.

2. **Write the two types of functions**

   i. Single row functions
   ii. Group functions

3. **What are single row functions?**

   A single row function or scalar function returns only one value for every row queries in table. Single row function can appear in a select command and can also be included in a where clause. The single row function can be broadly classified as,

   o Date Function
   o Numeric Function
   o Character Function
   o Conversion Function
   o Miscellaneous Function

4. **List some character funcitons**

   initcap(char);
   lower (char);
   upper (char);
   ltrim (char,[set]); rtrim (char,[set]);