

CHAPTER - 6

PL/SQL

6.1 Introduction :

PL/SQL is an extension of Structured Query Language (SQL) that is used in Oracle. Unlike SQL, PL/SQL allows the programmer to write code in a procedural format. Full form of PL/SQL is "Procedural Language extensions to SQL". PL/SQL is superset of SQL.

It combines the data manipulation power of SQL with the processing power of procedural language to create super powerful SQL queries.

Architecture of PL/SQL

The PL/SQL architecture mainly consists of following three components:

1. PL/SQL block
2. PL/SQL Engine
3. Database Server

Def : PL/SQL is a block structured language that enables developers to combine the power of SQL with procedural statements. All the statements of a block are passed to oracle engine all at once which increases processing speed and decreases the traffic.

Features of PL/SQL :

1. PL/SQL is basically a procedural language, which provides the functionality of decision making, iteration and many more features of procedural programming languages.
2. PL/SQL can execute a number of queries in one block using single command.

3. One can create a PL/SQL unit such as procedures, functions, packages, triggers, and types, which are stored in the database for reuse by applications.
4. PL/SQL provides a feature to handle the exception which occurs in PL/SQL block known as exception handling block.
5. Applications written in PL/SQL are portable to computer hardware or operating system where Oracle is operational.
6. PL/SQL Offers extensive error checking.

Advantage of Using PL/SQL

1. Better performance, as SQL is executed in bulk rather than a single statement
2. High Productivity
3. Tight integration with SQL
4. Full Portability
5. Tight Security
6. Support Object Oriented Programming concepts.

Disadvantages of SQL :

- SQL doesn't provide the programmers with a technique of condition checking, looping and branching.
- SQL statements are passed to Oracle engine one at a time which increases traffic and decreases speed.
- SQL has no facility of error checking during manipulation of data.

6.2 PL/SQL Basics

Like other programming languages, PL/SQL has a character set, reserved words, punctuation, datatypes, and fixed syntax rules.

Character Sets and Lexical Units

PL/SQL programs are written as lines of text using a specific set of characters:

- Upper- and lower-case letters A .. Z and a ..z
- Numerals 0 .. 9
- Symbols () + - * / <>= ! ~ ^ ; : . ' @ % , " # \$ & _ | { } ? []
- Tabs, spaces, and carriage returns

PL/SQL keywords are not case-sensitive, so lower-case letters are equivalent to corresponding upper-case letters except within string and character literals.

6.3 PL/SQL Block Structure:

PL/SQL extends SQL by adding constructs found in procedural languages, resulting in a structural language that is more powerful than SQL. The basic unit in PL/SQL is a block. All PL/SQL programs are made up of blocks, which can be nested within each other.

Typically, each block performs a logical action in the program. A block has the following structure :

DECLARE

declaration statements;

BEGIN

executable statements

EXCEPTIONS

exception handling statements

END;

- Declare section starts with **DECLARE** keyword in which variables, constants, records as cursors can be declared which stores data temporarily. It basically consists definition of PL/SQL identifiers. This part of the code is optional.
- Execution section starts with **BEGIN** and ends with **END** keyword. This is a mandatory section and here the program logic is written to perform any task like loops and conditional statements. It supports all **DML** commands, **DDL** commands and SQL*PLUS built-in functions as well.

- Exception section starts with **EXCEPTION** keyword. This section is optional which contains statements that are executed when a run-time error occurs. Any exceptions can be handled in this section.

6.4 SQL VS PL/SQL

SQL	PL/SQL
1. No Procedural Capabilities : SQL does not have procedural capabilities i.e. SQL does not provide the programming techniques of conditional checking, looping and branching. 2. Time Consuming Processing : SQL statements are passed to Oracle Engine one at a time. Each time a SQL statement is executed, a call is made to engine's resources. This adds to the traffic on the network and thereby decreasing the speed of processing. 3. No Error handling Procedures : While processing an SQL statement, if an error occurs, the Oracle engine displays its own error messages. SQL has no facility for programmed handling of errors that arise during manipulation of data. 4. No facilities Sharing : SQL does not allow sharing of facilities.	1. Procedural Capabilities : PL/SQL is a procedural extension of to SQL. PL/SQL supports programming techniques of conditional checking, looping and branching. 2. Reduced Network Traffic : PL/SQL statements sends an entire block of statements at one time. This reduces network time considerably. 3. Error Handling Procedures : PL/SQL supports error handling routines. 4. Facilities Sharing : PL/SQL allows in database thereby providing access and sharing of same subprogram by multiple applications.

6.5 PL/SQL identifiers

There are several PL/SQL identifiers such as variables, constants, procedures, cursors, triggers etc.

1. **Variables** : Like several other programming languages, variables in PL/SQL must be declared prior to its use. They should have a valid name and data type as well.

Syntax for declaration of variables :

variable_namedatatype [NOT NULL := value];

Example to show how to declare variables in PL/SQL :

```
SQL> SET SERVEROUTPUT ON;
```

```
SQL> DECLARE
```

```
    var1 INTEGER;
```

```
    var2 REAL;
```

```
    var3 varchar2(20) ;
```

```
BEGIN
```

```
    null;
```

```
END;
```

```
/
```

Output :

PL/SQL procedure successfully completed.

Explanation :

- **SET SERVEROUTPUT ON** : It is used to display the buffer used by the dbms_output.
- **var1 INTEGER** : It is the declaration of variable, named **var1** which is of integer type. There are many other data types that can be used like float, int, real, smallint, long etc. It also supports variables used in SQL as well like NUMBER(prec, scale), varchar, varchar2 etc.
- **PL/SQL procedure successfully completed** : It is displayed when the code is compiled and executed successfully.

- **Slash (/) after END;** The slash (/) tells the SQL*Plus to execute the block.

6.6 Control flow statement in PL SQL

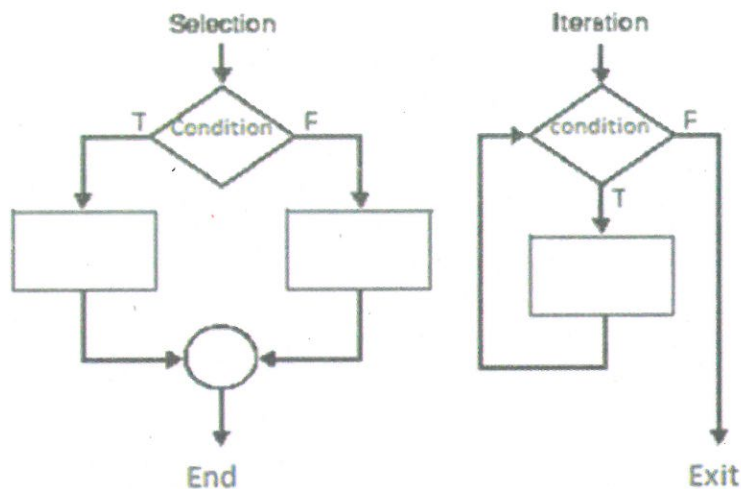
Control Structures in PL/SQL

A condition is any variable or expression that returns a BOOLEAN value (TRUE or FALSE). The iteration structure executes a sequence of **statements** repeatedly as long as a condition holds true. The sequence structure simply executes a sequence of **statements** in the order in which they occur.

PL/SQL supports groups of execution control statements :

- IF Statements - Conditionally executes a block of statements.
- LOOP Statements - Repeatedly executes a block of statements

Control Structures



6.7 IF Statements :

The IF statement executes a sequence of statements depending on the value of a condition.

There are three forms of IF statements :

- IF-THEN
- IF-THEN-ELSE
- IF-THEN-ELSIF.

IF type	Characteristics
IF THEN END IF;	This is the simplest form of the IF statement. The condition between IF and THEN determines whether the set of statements between THEN and END IF should be executed. If the condition evaluates to FALSE, the code is not executed.
IF THEN ELSE END IF;	This combination implements an either/or logic: based on the condition between the IF and THEN keywords, execute the code either between THEN and ELSE or between ELSE and END IF. One of these two sections of executable statements is performed.
IF THEN ELSIF ELSE END IF;	This last and most complex form of the IF statement selects a condition that is TRUE from a series of mutually exclusive conditions and then executes the set of statements associated with that condition. If you're writing IF statements like this using any release from Oracle9i Database Release 1 onwards, you should consider using searched CASE statements instead.

6.7.1 Using the IF-THEN Statement

The simplest form of IF statement associates a condition with a sequence of statements enclosed by the keywords THEN and END IF (not ENDIF)

The sequence of statements is executed only if the condition is TRUE. If the condition is FALSE or NULL, the IF statement does nothing. In either case, control passes to the next statement.

Syntax :

```
IF < Condition > THEN
    < Action >
END IF;
```

OR

IFcondition

THEN

... *sequence of executable statements* ...

END IF;

Write a program in PL/SQL to check the given value is greater than 50 by using IF-THEN Statement.

DECLARE

a NUMBER :=60;

BEGIN

dbms_output.put_line('Program started.');

IF(a > 50) THEN

dbms_output.put_line('a is greater than 50');

END IF;

dbms_output.put_line('Program completed.');

END;

/

Output:

a is greater than 50

6.7.2 Using the IF-THEN-ELSE Statement

Use the IF-THEN-ELSE format when you want to choose between two mutually exclusive actions. The format of this either/or version of the IF statement is as follows:

Syntax :

IFcondition

THEN

... *TRUE sequence of executable statements* ...

ELSE

... *FALSE/NULL sequence of executable statements* ...

END IF;

The *condition* is a Boolean variable, constant, or expression. If *condition* evaluates to TRUE, the executable statements found after the

THEN keyword and before the ELSE keyword are executed (the “TRUE sequence of executable statements”). If *condition* evaluates to FALSE or NULL, the executable statements that come after the ELSE keyword and before the matching END IF keywords are executed (the “FALSE/NULL sequence of executable statements”). Notice that the ELSE clause does not have a THEN associated with it.

The important thing to remember is that one of the two sequences of statements will *always* execute, because IF-THEN-ELSE is an either/or construct. Once the appropriate set of statements has been executed, control passes to the statement immediately following the END IF keyword.

Write a program in PL/SQL to check the given value is greater or less than 50 by using IF-THEN-ELSE Statement.

```
DECLARE
a NUMBER :=30;
BEGIN
dbms_output.put_line('Program started.' );
IF( a > 50 ) THEN
dbms_output.put_line('a is greater than 50');
ELSE
dbms_output.put_line('a is less than 50');
END IF;
dbms_output.put_line('Program completed.');
```

/

Output :

a is less than 50

6.7.3 Using the IF-THEN-ELSIF Statement

This last form of the IF statement comes in handy when you have to implement logic that has many alternatives; it is not an either/or situation. The IF-ELSIF formulation provides a way to handle multiple conditions within a single IF statement. In general, you should use ELSIF with mutually exclusive alternatives (i.e., only one condition can be TRUE

for any execution of the IF statement). The general format for this variation of IF is :

Syntax :

```
IF condition-1
    THEN
    statements-1
    ELSIF condition-N
    THEN
    statements-N
    [ELSE
    else_statements]
    END IF;
```

Each ELSIF clause must have a THEN after its *condition*. Only the ELSE keyword does not need the THEN keyword. The ELSE clause in the IF-ELSIF is the “otherwise” of the statement. If none of the conditions evaluate to TRUE, the statements in the ELSE clause are executed. But the ELSE clause is optional. You can code an IF-ELSIF that has only IF and ELSIF clauses. In such a case, if none of the conditions are TRUE, no statements inside the IF block are executed.

The conditions in the IF-ELSIF are always evaluated in the order of first condition to last condition. If two conditions evaluate to TRUE, the statements for the first such condition are executed.

Write a program in PL/SQL to display value of variable by using IF-THEN-ELSIF Statement.

```
DECLARE
a number(3):=60;
BEGIN
    IF ( a=10) THEN
dbms_output.put_line('Value of a is 10');
    ELSIF ( a=20) THEN
dbms_output.put_line('Value of a is 20');
    ELSIF ( a=30) THEN
dbms_output.put_line('Value of a is 30');
    ELSE
```

```
dbms_output.put_line('None of the values is matching');  
END IF;  
dbms_output.put_line('Exact value of a is: ' || a );  
END;  
/
```

Output :

None of the values is matching
Exact value of a is: 60

6.8 LOOP Statements/Iterative Control :

LOOP statements/Iterative control executes a sequence of statements multiple times or indicates the ability to repeat or skip sections of a code block.

A **loop** marks a sequence of statements that has to be repeated. The keyword **loop** has to be placed before the first statement in the sequence of statements to be repeated, while the keyword **end loop** is placed immediately after the last statement in the sequence.

Once a loop begins to execute, it will go on forever. Hence a conditional statement that controls the number of times a loop is executed always accompanies loops.

Types of Loop in PL/SQL

PL/SQL provides following three types of loops

- Basic loop statement
- For loop statement
- While loop statement

6.8.1 Basic LOOP Statement

The simplest form of LOOP statement is the basic (or infinite) loop, its execution block starts with keyword 'LOOP' and ends with the keyword 'END LOOP'. which encloses a sequence of statements between the keywords LOOP and END LOOP,

Syntax :

```
LOOP  
sequence_of_statements  
END LOOP;
```

With each iteration of the loop, the sequence of statements is executed, then control resumes at the top of the loop. If further processing is undesirable or impossible, you can use an EXIT statement to complete the loop. **You can place one or more EXIT statements anywhere inside a loop, but not outside a loop.**

Loop Syntax with Exit Statement :

LOOP

<execution block starts>

<EXIT condition based on developer criteria>

<execution_block_ends>

END LOOP;

Syntax Explanation :

- In the above syntax, key word 'LOOP' marks the beginning of the loop and 'END LOOP' marks the end of the loop.
- The execution block contains all the code that needs to be executed including the EXIT condition.
- The execution part can contain any execution statement.

Note : Basic loop statement with no EXIT keyword will be an INFINITE-LOOP that will never stop.

Example : Program in PL/SQL code to print number from 1 to 5 using basic loop statement.

```
1. DECLARE
2.  a NUMBER :=1;
3.  BEGIN
4.    dbms_output.put_line('Program started. ');
5.    LOOP
6.      dbms_output.put_line(a);
7.      a:=a+1;
8.      EXIT WHEN a>5;
9.    END LOOP;
10.   dbms_output.put_line('Program completed. ');
11. END;
12. /
```

Basic
Loop

Output:

Program started.

1

2

3

4

5

Program completed.

Program Explanation :

- **Code line 2:** Declaring the variable 'a' as 'NUMBER' data type and initializing it with value '1'.
- **Code line 4:** Printing the statement "Program started".
- **Code line 5:** Keyword 'LOOP' marks the beginning of the loop.
- **Code line 6:** Prints the value of 'a'.
- **Code line 7:** Increments the value of 'a' by +1.
- **Code line 8:** Checks whether the value of 'a' is greater than 5.
- **Code line 9:** Keyword 'END LOOP' marks the end of execution block.
- The code from line 6 to line 8 will continue to execute till 'a' reaches the value 6, as the condition will return TRUE, and the control will EXIT from the loop.
- **Code line 10:** Printing the statement "Program completed"

6.8.2 For loop statement :

Simple **FOR loops** iterate over a specified range of integers. The number of iterations is known before the loop is entered. A double dot (..) serves as the range operator. The range is evaluated when the FOR loop is first entered and is never re-evaluated. If the lower bound equals the higher bound, the loop body is executed once.

In this loop, the lower limit and the higher limit will be specified and as long as the loop variable is in between this range, the loop will be executed. The loop variable is self-incremental, so no explicit increment operation is needed in this loop. The loop variable need not to be declared, as it is declared implicitly.

Syntax :

```
FOR <loop_variable> in <lower_limit> ..<higher_limit>
LOOP
<execution block starts>
.
.
.
<execution_block_ends>
END LOOP;
```

Syntax Explanation :

- In the above syntax, keyword 'FOR' marks beginning of the loop and 'END LOOP' marks the end of the loop.
- Loop variable is evaluated every time before executing the execution part.
- The execution block contains all the code that needs to be executed. The execution part can contain any execution statement.
- The loop_variable is declared implicitly during the execution of the entire loop, and the scope of this loop_variable will be only inside this loop.
- If the loop variable came out of the range, then control will exit from the loop.
- The loop can be made to work in the reverse order by adding the keyword 'REVERSE' before lower_limit.

Example : Program in PL/SQL code to print number from 1 to 5 using FOR loop statement.

The image shows a screenshot of a PL/SQL program and its output. The program code is as follows:

```
1. BEGIN
2.  dbms_output.put_line('Program started. ');
3.  FOR a IN 1 .. 5
4.  LOOP
5.    dbms_output.put_line(a);
6.  END LOOP;
7.  dbms_output.put_line('Program completed. ');
8.  END;
9.  /
```

Annotations on the code:

- A box highlights the line `FOR a IN 1 .. 5` with a callout bubble labeled "Range specification".
- A box highlights the lines `FOR a IN 1 .. 5` and `LOOP` with a callout bubble labeled "FOR LOOP".

The output of the program is shown below the code:

```
Output:
Program started.
1
2
3
4
5
Program completed.
```

A box labeled "Loops in PL/SQL" is positioned to the right of the output numbers 2 through 5.

Program Explanation :

- **Code line 2:** Printing the statement "Program started".

- **Code line 3:** Keyword 'FOR' marks the beginning of the loop and loop_variable 'a' is declared. It now will have the value starting from 1 to 5
- **Code line 5:** Prints the value of 'a'.
- **Code line 6:** Keyword 'END LOOP' marks the end of execution block.
- The code from line 5 will continue to execute till 'a' reaches the value 6, as the condition will fail, and the control will EXIT from the loop.
- **Code line 7:** Printing the statement "Program completed"

6.8.3 WHILE LOOP Statement

WHILE loop statement works similar to the Basic loop statement except **the EXIT condition is at the very beginning of the loop.**

It works like an entry-check loop in which execution block will not even be executed once if the condition is not satisfied, as the exit condition is checking before execution part. It does not require keyword 'EXIT' explicitly to exit from the loop since it is validating the condition implicitly each time of the loop.

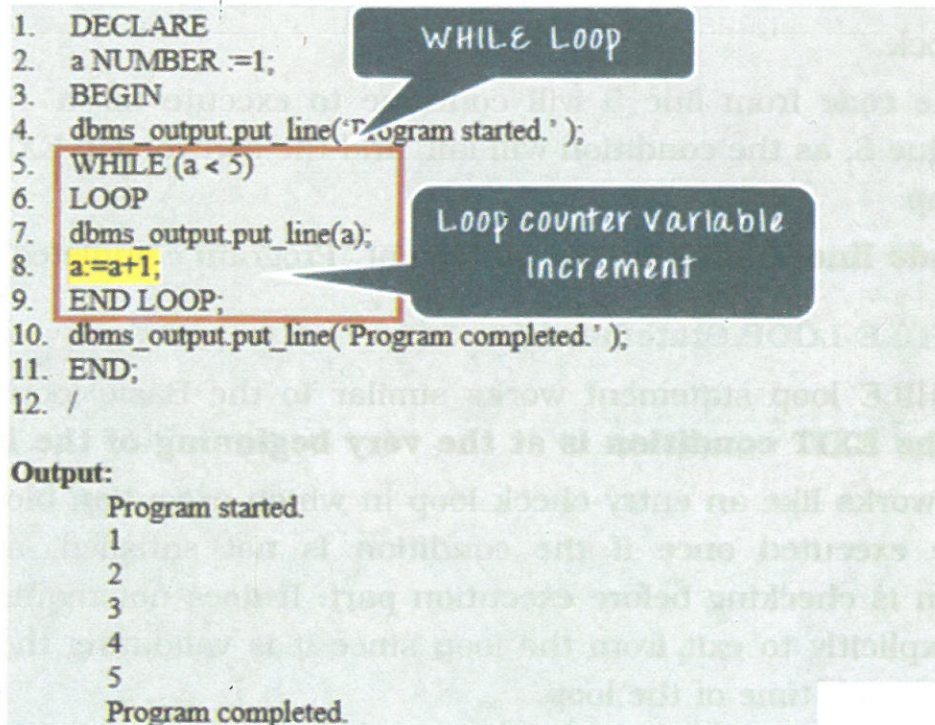
Syntax :

```
WHILE <EXIT condition>
  LOOP
  <execution block starts>
  .
  .
  .
  <execution_block_ends>
  END LOOP;
```

- In the above syntax, keyword 'WHILE' marks beginning of the loop and 'END LOOP' marks the end of the loop.
- EXIT condition is evaluated each time before the execution part is starting executing.

- The execution block contains all the code that needs to be executed.
- The execution part can contain any execution statement.

Example : Program in PL/SQL code to print number from 1 to 5 using WHILE loop statement.



- **Code line 2:** Declaring the variable 'a' as 'NUMBER' data type and initializing it with value '1'.
- **Code line 4:** Printing the statement "Program started".
- **Code line 5:** Keyword 'WHILE' marks the beginning of the loop, and it also checks whether the value of 'a' is greater than 5
- **Code line 7:** Prints the value of 'a'.
- **Code line 8:** Increments the value of 'a' by +1.
- **Code line 9:** Keyword 'END LOOP' marks the end of execution block.
- The code from line 7 and line 8 will continue to execute till 'a' reaches the value 6, as the condition will return TRUE, and the control will EXIT from the loop.
- **Code line 10:** Printing the statement "Program completed"

6.9 Trigger

A trigger is a PL/SQL block structure which is fired when a DML statements like INSERT, DELETE, UPDATE is executed on a database table. A trigger is triggered automatically when an associated DML statement is executed. Triggers are basically PL/SQL procedures that are associated with tables, and are called whenever a certain modification (event) occurs. The modification statements may include INSERT, UPDATE, and DELETE. Triggers are stored programs, which are automatically executed or fired when some events occur.

Triggers are, in fact, written to be executed in response to any of the following events :

- ❑ A database manipulation (DML) statement (DELETE, INSERT, or UPDATE).
- ❑ A database definition (DDL) statement (CREATE, ALTER, or DROP).
- ❑ A database operation (SERVERERROR, LOGON, LOGOFF, STARTUP, or SHUTDOWN).

Triggers could be defined on the table, view, schema, or database with which the event is associated.

Benefits of Triggers

Triggers can be written for the following purposes :

- ❑ Generating some derived column values automatically
- ❑ Enforcing referential integrity
- ❑ Event logging and storing information on table access
- ❑ Auditing
- ❑ Synchronous replication of tables
- ❑ Imposing security authorizations
- ❑ Preventing invalid transactions.

Different types of triggers in PL/SQL

PL/SQL has four types of triggers which are given below.

1. **Row level Triggers and Statement level Triggers** : A statement level trigger is fired once on behalf of the triggering statement, regardless of the number of rows in the table that the triggering statement affects. A row trigger fires once for each row affected by the triggering event.
2. **BEFORE and AFTER Triggers** : BEFORE triggers run the trigger action before the triggering statement is run. BEFORE trigger execute before the triggering DML statement (INSERT, UPDATE, DELETE) execute. AFTER triggers run the trigger action after the triggering statement is run. AFTER trigger execute after the triggering DML statement (INSERT, UPDATE, DELETE) executed.
3. **INSTEAD OF Triggers** : INSTEAD OF triggers describe how to perform insert, update, and delete operations against views that are too complex to support these operations natively. INSTEAD OF triggers allow applications to use a view as the sole interface for all SQL operations (insert, delete, update and select).

Triggers on System Events and User Events : You can use triggers to publish information about database events to subscribers. System events are for example Database startup and shutdown, Data Guard role transitions etc and User Events are User logon and logoff, DDL statements (CREATE, ALTER, and DROP) etc.

6.10 Cursor

We can manipulate the information within a SQL statement by means of assigning a name to a “select statement”, this concept is known a **cursor**. A **cursor** is used for processing individual rows returned as a result for a query. Cursor is the work area which Oracle reserves for internal processing of SQL statements. This work area is private for oracles reserved are called cursor. A cursor holds the rows (one or more) returned by a SQL statement. The set of rows the cursor holds is referred to as the **active set**.

You can name a cursor so that it could be referred to in a program to fetch and process the rows returned by the SQL statement, one at a time. There are two types of cursors :

1. Implicit Cursors
2. Explicit Cursors

1. Implicit Cursors : Implicit cursors are automatically created by PL/SQL whenever an SQL statement is executed. Programmers cannot control the implicit cursors and the information in it.

Whenever a DML statement (INSERT, UPDATE and DELETE) is issued, an implicit cursor is associated with this statement. For INSERT operations, the cursor holds the data that needs to be inserted. For UPDATE and DELETE operations, the cursor identifies the rows that would be affected.

Different attributes of implicit cursor are

%FOUND, %ISOPEN, %NOTFOUND, and %ROWCOUNT.

Attribute	Description
%FOUND	Returns TRUE if an INSERT, UPDATE, or DELETE statement affected one or more rows or a SELECT INTO statement returned one or more rows. Otherwise, it returns FALSE.
%NOTFOUND	The logical opposite of %FOUND. It returns TRUE if an INSERT, UPDATE, or DELETE statement affected no rows, or a SELECT INTO statement returned no rows. Otherwise, it returns FALSE.
%ISOPEN	Always returns FALSE for implicit cursors, because Oracle closes the SQL cursor automatically after executing its associated SQL statement.
%ROWCOUNT	Returns the number of rows affected by an INSERT, UPDATE, or DELETE statement, or returned by a SELECT INTO statement.

Explicit Cursors

The Explicit cursors are defined by the programmers to gain more control over the context area. These cursors should be defined in the declaration section of the PL/SQL block. It is created on a SELECT statement which returns more than one row.

Syntax of explicit cursor

CURSOR cursor_name **IS** select_statement;

Steps :

You must follow these steps while working with an explicit cursor.

- 1. Declare the cursor :** It is used to initialize in the memory and defines the cursor with a name and the associated SELECT statement.
- 2. Open the cursor :** It is used to allocate memory for the cursor and make it easy to fetch the rows returned by the SQL statements into it.
- 3. Fetch the cursor :** It is used to retrieve data by access one row at a time.

These are now called as active sets. Fetching data from the cursor is a record-level activity that means we can access the data in a record-by-record.

- 4. Close the cursor :** It is used to release the allocated memory. Once all the record is fetched, we need to close the cursor so that the memory allocated to this context area will be released.

6.11 Trigger Vs. Cursor

TRIGGER	CURSOR
Triggers are named PL SQL blocks.	Cursors are temporary work areas.
Triggers are stored in database.	Cursors are not stored independently in the database.
Triggers can be invoked automatically.	We can create cursor both implicitly and explicitly.
Triggers cannot take parameters.	Cursors can take parameters.
Triggers are used to enforce data in dignity rules.	Cursors are used to process the result of query.

SUMMARY

- PL/SQL stands for Procedural Language/Structured Query Language.
- PL/SQL is a superset of SQL.
- PL/SQL is a Block Structure language that enables developer to combine the power of SQL with Procedural statement.
- Applications written in PL/SQL are portable to any computer hardware and operating system where oracle is operational.
- PL/SQL divided into logical block.
- PL/SQL Block Structure used four sections: Declare, Begin, Exception and End.
- The Declare Section start with Declare Keyword in which memory variable initialized.
- The Begin Section start with Begin Keyword in which consist set of SQL statement to manipulate data in the database.
- The Exception Section start with Exception Keyword, that handles error occur during execution..
- The End statement marks the end of PL/SQL Block.
- Trigger defines an action that database should take, when some database related events occur
- Triggers fired automatically when database events occur.
- A row level trigger is fired each time a row in the table is affected by the triggering statement.
- A Statement trigger is fired once on behalf of the triggering statements, independent of the number of rows, the triggering statements effected.
- Before trigger execute the trigger action before the triggering statement.

- After Trigger executes the trigger action after the trigger statement is executed.
- A cursor is handle or pointer to the context area.
- The area allocated for processing a SQL statement is known as context area.
- Cursors are of two types: Implicit and explicit cursor.
- Internal processing of Oracle engine statements is known as implicit cursor.
- The Explicit cursors are defined by the programmers to gain more control over the context area.

TRUE/FALSE

- A Cursor is handler or pointer to the context area. (T)
- A Trigger is handler or pointer to the context area. (F)
- Two kinds of cursor used in oracle are implicit and explicit cursor. (T)
- A variable is a name associate with value. (T)
- PL/SQL stands for Procedural Language/Structure Query Language. (T)
- PL/SQL is not a Procedural Language. (F)
- PL/SQL is superset of SQL. (T)
- Cursor can take parameters. (T)
- Cursor cannot take parameters. (F)
- Trigger cannot take parameters. (T)
- Error handling in PL/SQL is called Exception. (T)
- Pl/SQL supports error handling routine. (T)
- SQL does not has procedural capabilities. (T)

SOLVED PROGRAMS

Write PL/SQL code to find the area of circle.

Sol :

```
declare
radius float;
area float;
begin
radius := 3;
area:=3.14*radius*radius;
dbms_output.put_line ('The area of circle is'||area);
end;
```

OUTPUT :

The area of circle is 28.26

Write PL/SQL Code to find area of a rectangle.

Sol :

```
DECLARE
LENGTH                NUMBER (6, 2) ;
BREADTH                NUMBER (6, 2) ;
AREA                  NUMBER (10, 2) ;
BEGIN
LENGTH :                = 9 ;
BREADTH :              = 10 ;
AREA :                 = LENGTH * BREADTH ;
DBMS_OUTPUT.PUT_LINE (AREA) ;
END ;
```

Output : 90

Write PL/SQL Code to find area of a triangle.

Sol :

```
DECLARE
base                   NUMBER (6, 2) ;
height                 NUMBER (6, 2) ;
area                   NUMBER (16, 2) ;
BEGIN
base : = 8 ;
height : = 10 ;
area : = base * height/2 ;
DBMS_OUTPUT.PUT_LINE (area) ;
END ;
```

/

Output : 40

Write a PL/SQL program to print the series from 1 to 50.

```
Sol:  BEGIN
        FOR NUM IN 1..50
        LOOP
            DBMS_OUTPUT.PUT_LINE (NUM || ' ');
        END LOOP;
        DBMS_OUTPUT.PUT_LINE (' ');
    END;
    /
```

Write a PL/SQL program to print the following series from 1,4,7,10...40.

```
Sol:  DECLARE
        I NUMBER(2);
    BEGIN
        I := 1;
        DBMS_OUTPUT.ENABLE
    WHILE (I <= 40)
    LOOP
        DBMS_OUTPUT.PUT(I || ' ');
        I := I + 3;
    END LOOP;
    DBMS_OUTPUT.PUT_LINE(' ');
    END;
    /
```

EXERCISE

- Q1.** What is PL/SQL ?
- Q2.** What are advantages and disadvantages of PL/SQL ?
- Q3.** What is difference between the SQL and PL/SQL.
- Q4.** Explain the PL/SQL block structure.
- Q5.** What is variable? Explain it.
- Q6.** What do you mean by control structure ? Explain it.
- Q7.** What do you mean by IF Statement? Explain its types with example.
- Q8.** What do you mean by loop statements/ Iterative control ?
- Q9.** Explain the FOR Loop and While Loop with an example.
- Q10.** What do you mean by Trigger? Write its advantages.
- Q11.** Explain the types of Trigger.
- Q12.** What do you mean by cursor? What are different types of cursor?
- Q13.** Define the Implicit cursor and Explicit Cursor.
- Q14.** Differentiate the Trigger and Cursor.
- Q15. Explain the following cursor attributes :**
 - 1) %Found 2) %NOTFOUND 3) %ISOPEN 4) %ROWCOUNT

—End—

INTERNET BUSINESS APPLICATIONS

7.1 Online Services

An online service refers to any information and services provided over the Internet. These services not only allow subscribers to communicate with each other, but they also provide unlimited access to information. Online services can range from simple to complex. Online services may be free or paid. An online service provider may be a local, international, or global company who specializes in online services or allows you to connect to online services through their network. An organization that provides an information service over the Internet. One aspect of online services is electronic commerce. Companies can create an interface online to allow customers to order products and services at any time. Schools, Colleges and universities use online services for their students to cut down on paperwork. Students might be able to register for classes online. Government agencies also use online services to reach citizens.

7.2 Different Online Services

Online Services	Examples
Communication	Email, Instant messaging, Online conferencing, social networking e.g Facebook, chat, Twitter etc.,
Real Time Information	Train Timetables, news services, traffic reports, weather
Commerce	Shopping, banking, auctions
Government	Online tax returns, applications for various governments, Revenue collection, Health services
Education	Online learning, School/college/hpbose websites, Online counseling.
Business	Video conferencing, online share trading
Entertainment	Multi user games, radio players, sports, books
Download services	Softwares, upgrades, music, film
Web storage	Google docs, Drop Box
Online mapping and route planning	Google maps, navigation

7.3 ADVANTAGES AND DISADVANTAGES OF ONLINE SERVICES

The advantages of online services are as follows :

- 1. Convenience :** You shop whenever you want to Online shops are never closed. You can use any of the service at whatever time you desire.
- 2. Saves time :** Much quicker and less hassle.
- 3. Greater choice :** A large number of options are available. So you can choose the best one.
- 4. Better prices :** You can compare prices between suppliers. Internet offers bargain prices not available elsewhere.
- 5.** No travel costs, traffic jams or car parking space needed. No queuing at checkouts. Weather doesn't matter.
- 6.** Convenient delivery.
- 7. Reduced long-term costs :** Businesses do not need to pay for expensive shop premises, running costs (bills, insurance) and sales staff.
- 8. Wider customer base :** Products can be sold to customers all-over the country/world and not just in the area where the shop is based.
- 9. Added Items :** Customers often impulse buy when online and buy extra items.
- 10.** Online learning reduces travel time and travel costs for off-campus students.
- 11.** Students may have the option to select learning materials that meets their level of knowledge and interest.
- 12.** Students can study anywhere they have access to computer and Internet connection
- 13. Freedom of choice :** Freedom of choice is very high in online than Shopping from a nearby store. In online you can choose the product you are looking, from a vast range of products.
- 14. High satisfaction percentage :** Now a days shopping online is very reliable.

- 15. Privacy :** There are some products which you don't want to buy publicly You can buy any kind of product from online web store anonymously to maintain your desired privacy.
- 16. Data storage saving :** By storing your data online you are reducing the burden of your hard disk, which means you are eventually saving disk space.
- 17.** Online account is simple to open and easy to operate.
- 18.** It is quite convenient as you can easily pay your bills, can transfer funds between accounts, etc.
- 19.** With **Internet banking**, you can keep an eye on your transactions and account balance all thetime.

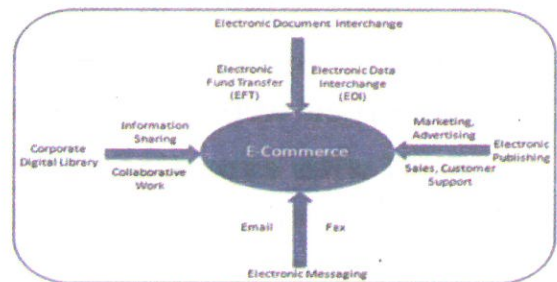
The disadvantages of online Services are as follows :

- 1. Cost :** Businesses will normally need to pay out a lot of money to have their websites professionally designed and developed.
- 2. Staff with expertise :** The staff required to run the online business will need to have the expertise to manage the website and keep it maintained.
- 3. Website downtime :** If the website goes down, no one will be able to purchase anything meaning the company are making no money.
- 4. Online Fraud :** A lot of online fraud, means there is a risk of losing money on sales.
- 5. Delay :** The main disadvantage of online shopping is, you cannot receive the product immediately.
- 6. Inferior product ;** You don't know about the actual quality of the product. Sometimes the description of the product might be different than the actual product.
- 7. Shipping Charge :** Shipping charge and shipping delays are one of the main disadvantage of Shopping online.
- 8.** Students may-feel isolated from the instructor and classmates.
- 9.** Slow Internet connections or older computers may make accessing course materials frustrating.

7.4 E- Commerce

Electronic commerce (EC) The process of buying, selling, transferring, or exchanging products, services, or information via computer networks. E-business is a broader definition of EC that includes not just the buying and selling of goods and services, but also servicing customers, collaborating with business partners, and conducting electronic transactions within an organization. E-Commerce or Electronics Commerce is a methodology of modern business which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery. E-commerce refers to paperless exchange of business information using following ways.

- Electronic Data Exchange (EDI)
- Electronic Mail (E-mail)
- Electronic Bulletin Boards
- Electronic Fund Transfer (EFT)
- Other Network-based technologies



Features

E-Commerce provides following features

- **Non-Cash Payment** “ E-Commerce enables use of credit cards, debit cards, smart cards, electronic fund transfer via bank’s website and other modes of electronics payment.
- **24x7 Service availability** “ E-commerce automates business of enterprises and services provided by them to customers are available anytime, anywhere. Here 24x7 refers to 24 hours of each seven days of a week.
- **Advertising / Marketing** “ E-commerce increases the reach of advertising of products and services of businesses.
- **Improved Sales** “ Using E-Commerce, orders for the products can be generated any time, any where without any human intervention. By this way, dependencies to buy a product reduce at large and sales increases.

- **Support** “ E-Commerce provides various ways to provide pre sales and post sales assistance to provide better services to customers.

Traditional Commerce v/s E-Commerce

Sr. No.	Traditional Commerce	E-Commerce
1.	Heavy dependency on information exchange from person to person.	Information sharing is made easy via electronic communication channels making little dependency on person to person information exchange.
2	Manual intervention is required for each communication or transaction.	Communication or transaction can be done in asynchronous way. Electronics system automatically handles when to pass communication to required person or do the transactions.
3	It is difficult to establish and maintain standard practices in traditional commerce.	A uniform strategy can be easily established and maintain in e-commerce.
4	Communications of business depends upon individual skills.	In e-Commerce or Electronic Market, there is no human intervention.
5	Unavailability of a uniform platform as traditional commerce depends heavily on personal communication.	E-Commerce website provides user a platform where all information is available at one place.

Classification of EC by the nature of the transactions or interactions

E-Commerce or Electronics Commerce business models can generally categorized in following categories.

- Business - to - Business (B2B)

- Business - to - Consumer (B2C)
- Consumer - to - Consumer (C2C)
- Consumer - to - Business (C2B)
- Business - to - Government (B2G)
- Government - to - Business (G2B)
- Government - to - Citizen (G2C)

Business - to - Business (B2B) : Website following B2B business model sells its product to an intermediate buyer who then sells the product to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end product to final customer who comes to buy the product at wholesaler's retail outlet.

Business - to - Consumer(B2C) : Website following B2C business model sells its product directly to a customer. A customer can view products shown on the website of business organization. The customer can choose a product and order the same. Website will send a notification to the business organization via email and organization will dispatch the product/goods to the customer.

Consumer - to - Consumer (C2C) : Website following C2C business model helps consumer to sell their assets like residential property, cars, motorcycles etc. or rent a room by publishing their information on the website. Website may or may not charge the consumer for its services. Another consumer may opt to buy the product of the first customer by viewing the post/advertisement on the website.

Consumer - to - Business (C2B) : In this model, a consumer approaches website showing multiple business organizations for a particular service. Consumer places an estimate of amount he/she wants to spend for a particular service. For example, comparison of interest rates of personal loan/ car loan provided by various banks via website. Business organization that fulfills the consumer's requirement within specified budget approaches the customer and provides its services.

Business - to - Government (B2G) : B2G model is a variant of B2B

model. Such websites are used by government to trade and exchange information with various business organizations. Such websites are accredited by the government and provide a medium to businesses to submit application forms to the government.

Government - to - Business (G2B) : Government uses B2G model website to approach business organizations. Such websites support auctions, tenders and application submission functionalities.

Government - to - Citizen (G2C) : Government uses G2C model website to approach citizen in general. Such websites support auctions of vehicles, machinery or any other material. Such website also provides services like registration for birth, marriage or death certificates. Main objectives of G2C website are to reduce average time for fulfilling people requests for various government services.

Modes of electronic payments

- Credit Card
- Debit Card
- Smart Card
- E-Money
- Electronic Fund Transfer (EFT)



Credit Card : Credit card is small plastic card with a unique number attached with an account. It has also a magnetic strip embedded in it which is used to read credit card via card readers. When a customer

purchases a product via credit card, credit card issuer bank pays on behalf of the customer and customer has a certain time period after which he/she can pay the credit card bill. It is usually credit card monthly payment cycle.

Debit Card : Debit card, like credit card is a small plastic card with a unique number mapped with the bank account number. It is required to have a bank account before getting a debit card from the bank.

Smart Card : Smart card is again similar to credit card and debit card in appearance but it has a small microprocessor chip embedded in it. It has the capacity to store customer work related/personal information.

E-Money : E-Money transactions refer to situation where payment is done over the network and amount gets transferred from one financial body to another financial body without any involvement of a middleman.

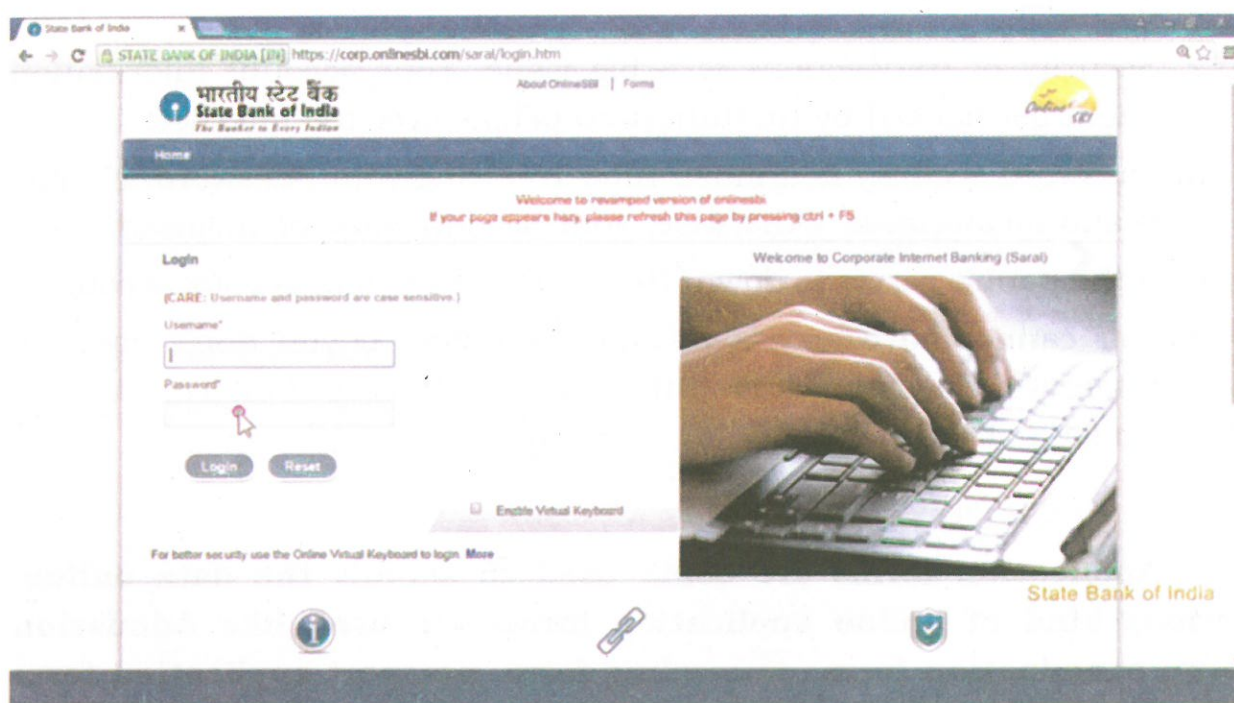
Electronic Fund Transfer : It is a very popular electronic payment method to transfer money from one bank account to another bank account. Accounts can be in same bank or different bank.

7.5 Net Banking

A system allowing individuals to perform banking activities at home, via the Internet. Some online banks are traditional banks which also offer online banking, while others are online only and have no physical presence. Online banking through traditional banks enable customers to perform all routine transactions, such as account transfers, balance inquiries, bill payments, and stop-payment requests, and some even offer online loan and credit card applications. Account information can be accessed anytime, day or night, and can be done from anywhere.

Net Banking, also called Internet or online banking, is the process of conducting banking transactions over the internet. Viewing bank statements and status of a bank account online also comes under the definition of net banking. The bank updates accounts and records of transactions almost instantly on the internet. It enables bank customers to handle account management and perform account transactions directly with the bank through the internet.

Every customer requires a User ID and a Login Password to access NetBanking. In addition a Transaction Password is required for conducting any transactions on NetBanking. In case there are five unsuccessful attempts to log in or transact on your NetBanking, the login/transaction password is disabled to prevent any unauthorized access. Furthermore, if you have logged into NetBanking and have not used the application for 10 minutes, the system automatically logs you out. This is to prevent any unauthorized access of your account, in case you have left your computer unattended, without having logged out of NetBanking.



Advantages of Internet banking

1. An online account is simple to open and easy to operate.
2. It's convenient, because you can easily pay your bills and transfer your funds between accounts from nearly anywhere in the world.
3. You do not have to stand in a queue to pay off your bills. Also you do not have to keep receipts of all of your bills, as you can now easily view your transactions.

4. It is available all the time. You can perform your tasks from anywhere and at any time, even at night or on holidays when the bank is closed.
5. It is fast and efficient. Funds get transferred from one account to the other very fast.
6. You can keep an eye on your transactions and account balance all the time.

Disadvantages of Internet banking

1. Understanding the usage of internet banking might be difficult for a beginner.
2. Security of transactions is a big issue. Your account information might get hacked by unauthorized people over the internet.
3. Password security is a must. After receiving your password, change it and memorize it. Otherwise, your account may be misused.
4. If the bank's server is down, then you cannot access your accounts.
5. You cannot have access to online banking if you don't have an internet connection; thus, without the availability of internet access, it may not be useful.

7.6 Online Submission of Various Forms

Application forms are being used to submit the data online. Various kind of online application forms are used like Admission form, examination form, counseling form, passport application form etc. The purpose of online form is to submit the information while customer is sitting at home. Customer need not to go to office and fill manual forms.

Before filling the online application, applicant may have a carefully read on all the common instructions and guide lines that are given for filling form. Carefully fill all details like- name, age, gender, nationality, qualification and other information so on. Then after all the fill entries in the form, check it again. The application form should be complete and filled in all respects. Click on the SUBMIT button for registration. After

submit form, a new window appear. It is a nextstep for reviewing and edits your information.

Student Registration Form

*Which Scheme You are Applying for : Higher Education ▼

*Academic Year : 2018-2019 ▼

*Do you have Aadhaar Number : ☐ Yes ☒ No

*EID : EID

*Student Name : Student First Name Student Middle Name Student Last Name

*Date of Birth : Click on Icon and Pick Date 

*Father Name : Father First Name Father Middle Name Father Last Name

*Mother Name : Mother First Name Mother Middle Name Mother Last Name

*Category : ---SELECT--- ▼ *Sub-Category : ---SELECT--- ▼

*Mobile No : Mobile No *e-Mail ID : sample@example.com

66n7bi 

Enter Captcha:

Note : ' * ' Indicates Mandatory Fields.

Register

Advantages of Online Form :

1. Quick and easy to fill.
2. Applications can be very easily filled 24 hours a day, 7 days a week.
3. Save time and money both.
4. System helps us checking for errors anywhere in online application and also gives suggestions.
5. We can be change details in right up till closing date.
6. No risk factor that the application will be lost during posting.
7. Easy payment mode. E-payment mode is cheap and faster mode.
8. Confirmation sent to you by email that the form has been received and generate registration id and password also.

9. The form checks itself for errors and it highlights anything you have missed.

Disadvantages of Online Form :

1. When we use e-banking for payment it's really unsafe, hacker can easily hack your account.
2. If we are upload any attachment like word document and so on it is bound with words limit.
3. Signature and photo uploads bound with properties.
4. If we forget password it creates problem.

7.7 Online Reservations

Online reservations are being used for booking the bus, train, air tickets, and hotel reservation while sitting at your home. It will let you book for your services online. On line reservation is a method which helps the travel and tourism industry support reservation through the internet. It helps consumers to book flights, hotels, holiday packages, insurance and other services online. e.g. The Indian Railway Catering and Tourism Corporation Limited provides online railway ticket reservation facility. It also provides information about various trains and hotel booking can also be carried on this web site. You need to have user name and password for making online booking of railway tickets.

Similarly you can make bus booking, air travel booking by using different websites. Travel and hotel booking can be done simultaneously by web sites like www.makemytrip.com.



Advantages of Online booking system

1. It's quicker and easier to book online.
2. Most airlines usually offer incentives for cheaper flights if you book online.
3. As with most things relating to holidays, the earlier you book, the more likely you will get a discount.
4. Booking online means that it's also easy to track prices. The prices can fluctuate daily so you can get a good deal by simply watching the prices on a price comparison website.
5. Large choice of hotels, tickets and easy to use interface and search engines.
6. Immediate confirmation, as per system announcement
7. Almost always availability in the hotel, even when the hotel is on stop sales.

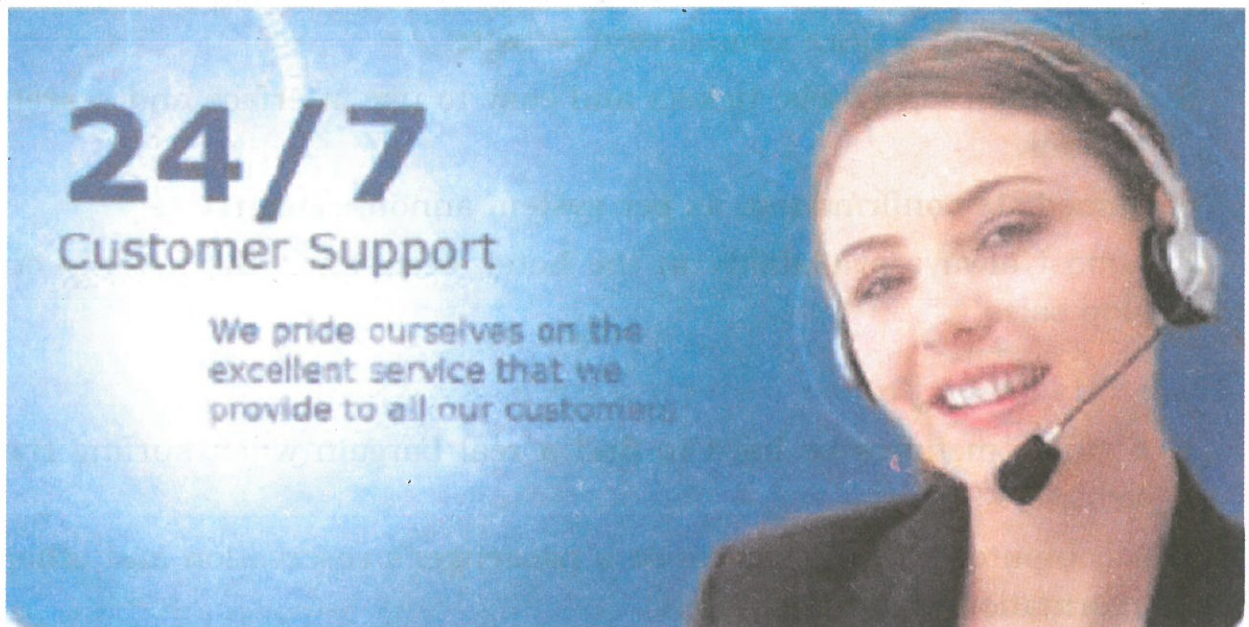
Disadvantages of Online booking system

1. It can sometimes be hard to find a real bargain when surfing the web.
2. A computer crash could cause a passenger's reservation and other information to simply vanish.
3. For online booking a well designed web site needs to be put in place along with a database.
4. You could make a mistake and book the wrong seats.
5. If the server is down or running very slowly, then much business can be lost and annoy a lot of customers.

7.8 Customer Support Services

Customer Service means Range of services provided to assist customers in making cost effective and correct use of a product. It includes assistance in planning, installation, training, trouble shooting, maintenance, upgrading, and disposal of the product. Good customer service is made, not born. Most companies find that employees require

training to provide good customer service. ONLINE Customer support services are providing services to customers by using internet or using phone call. One of the most basic types of customer service is the call center. The representatives who work at call center will usually be the first people to hear about the customer's concern and will either resolve the problem or contact the people who can. Company call centers are the link between customers and the company and how they handle customer concerns reflect on the company in a very important way.



ADVANTAGES :

1. You can reach out at the right time to provide pre-sale and post-sale support.
2. It is quicker and easy.
3. Complaints can be submitted very easily filled 24X7.
4. It provides high level of satisfaction.
5. It saves time and money.

Disadvantages

1. Some software is priced out of reach and takes a while to get used to.

2. Some software is difficult to get used to - in terms of training time and as your support needs grow.
3. Web-based customer service can seem less personal than a human voice on the other end of a phone line or a sympathetic agent in a retail store.
4. Need trained manpower.

7.9 Online Marketing and Shopping

The act of purchasing products or services over the Internet is known as online shopping. Online shopping has grown in popularity over the years, mainly because people find it convenient and easy to bargain shop from the comfort of their home or office. Internet marketing refers to advertising and marketing efforts that use the web and email to drive direct sales via electronic commerce, in addition to sales leads from web sites or emails. Online shopping is buying the products online i.e. buying the products while sitting on your computer or mobile device. It is a form of electronic commerce which allows consumers to directly buy goods or services from a seller over the internet using a web browser. The various online shopping sites are www.flipkart.com, www.amazon.in, www.firstcry.com, www.snapdeal.com, www.ebay.com, www.jabang.com etc.



Advantages of Shopping Online	Disadvantages of Shopping Online
Convenience	Negative Environmental Impact of Packaging and Gas
Better Prices	Shipping Problems and Delays
More Variety	Risk of Fraud
Easy to Send Gifts	Less Contact With Your Community
More Control	Spending Too Much Time Online
Easy Price Comparisons	Returns Can Be Complicated
No Crowds	You Don't Know Exactly What You're Getting
No Sales Pressure	Unfriendly, Scammy, or Complicated Websites
Access to Used or Damaged Inventory	No Sales Assistance
Privacy for Discreet Purchases	No Support for Local Retailers

7.10 Social Networking

It is the use of internet-based social media programs to make connections with friends, family, classmates, customers and clients. Social networking can be done for social purposes, business purposes or both. The programs show the associations between individuals and facilitate the acquisition of new contacts. Social networking service is an online service, platform, or site that focuses on facilitating the building of social networks or social relations among people who, for example, share interests, activities, backgrounds, or real-life connections. A social network service consists of a representation of each user (often a profile), his/her social links, and a variety of additional services. Most social network services are web-based and provide means for users to interact over the Internet, such as e-mail and instant messaging.

In Social Networking Site (SNS) Members create an online profile with biographical data, photos and any other information they choose to

post. They communicate with each other by making their latest thoughts public in a blog-like format or via e-mail, instant messaging or video chat.

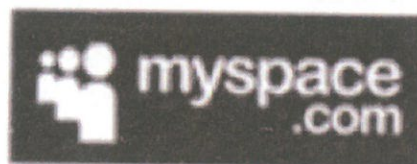
Companies use social sites to advertise products, gain brand recognition, as well as expand traffic to their main Web site.

A social networking website is an online platform that allows users to create a public profile and interact with other users on the website. Social networking websites usually have a new user input a list of people with whom they share a connection and then allow the people on the list to confirm or deny the connection. After connections are established, the new user can search the networks of his connections to make more connections. A social networking site may also be known as a social website or a social networking website.

Examples of social networks

1. **Bebo** (<http://www.bebo.com>) : A popular social networking site where users can share photo's, stories, their journal, and more with friends and family privately or publicly on the Internet.
2. **Classmates** (<http://www.classmates.com>) : One of the largest and most used websites that brings together and allows people who graduated from high school and allows you to keep in touch with them and any future reunions.
3. **Facebook** (<http://www.facebook.com>) : The most popular social networking websites on the Internet. Facebook is a popular destination for users to setup their own personal web pages, connect with friends, share pictures, share movies, talk about what you're doing, etc.
4. **Friendster** (<http://www.friendster.com>) : A popular social network that brings together friends, family, and allows you to meet new people who share similar interests to you from all over the world.
5. **Google+** (<http://plus.google.com>) : The latest social networking service from Google.

6. **LinkedIn** (<http://www.linkedin.com>) : One of the best locations to connect with current and past co-workers and potentially future employers.
7. **Path** (<http://path.com>) - A mobile only social network that allows you to keep in contact with your closest friends and family.
8. **Pinterest** (<http://www.pinterest.com>) - An upcoming and popular picture and sharing service that allows anyone to easily share pictures, create collections, and more.
9. **Twitter**(<http://www.twitter.com>) - Another fantastic service that allows users to post 140 character long posts from their phones and on the Internet. A fantastic way to get the pulse of what's going on around the world.
10. **YouTube** (<http://www.youtube.com>) - A great network of users posting video blogs or Vlog's and other fun and interesting videos.



Advantages :

1. Social Networks have decreased the distance between friends and relatives. You can talk to your friend and video chat with your relatives irrespective of distance between them.
2. These have increased the strength of relationships between friends and some distant relatives, as they chat in these social networks and know about them well.
3. These will provide opportunity to increase the communication skills as the person is not in front of you, one can talk freely
4. One can meet people with same ideology, interests and thinking in the groups in various Social networking sites
5. One can know the updates of his friends, even without talking with them personally.
6. One can pass their information to all his friends, just by posting the updates in social networks avoiding informing every person one by one. One can make new friends too.
7. One can make their ideas reach thousands of people with their posts thus becoming popular.
8. One can popularize their blog, website, institution using social networking and also can know updates of others too.
9. Social networking sites can also be a tool to promote your business, services, products or websites.
10. You do not need a technical skill to create a page.
11. Social networking sites are free to download.

Disadvantages :

1. The hackers are tend to be everywhere in the social networking. There is a possibility of committing fraud and send spam messages. There are also virus attacks possible in social networking.
2. Wastage of time:
3. Many people pretend to be someone else and prepare their online profiles with false information,so as to cheat unsuspecting users.

SUMMARY

Electronic commerce (EC) : The process of buying, selling, transferring, or exchanging products, services, or information via computer networks.

Modes of electronic payments are: Credit Card, Debit Card, Smart Card, E-Money, and Electronic Fund Transfer (EFT).

Net Banking, also called Internet or online banking, is the process of conducting banking transactions over the internet. Viewing bank statements and status of a bank account online also comes under the definition of net banking.

Online submission Forms : Application forms are being used to submit the data online. Various kind of online application forms are used like Admission form, examination form, counseling form, passport application form etc. The purpose of online form is to submit the information while customer is sitting at home. Customer need not to go to office and fill manual forms.

Online reservations are being used for booking the bus, train, air tickets, and hotel reservation while sitting at your home. It will let you book for your services online. On line reservation is a method which helps the travel and tourism industry support reservation through the internet. It helps consumers to book flights, hotels, holiday packages, insurance and other services online.

Customer Service means Range of services provided to assist customers in making cost effective and correct use of a product.

The act of purchasing products or services over the Internet is known as **online shopping**.

Social networking service is an online service, platform, or site that focuses on facilitating the building of social networks or social relations among people who, for example, share interests, activities, backgrounds, or real-life connections.

TRUE/FALSE

Q.1 State whether the following statements are True or False :

1. Online and Offline are the same terms.
2. Intranet represents dedicated network of computers within a single organizations.
3. Cost of creating e-commerce may be high.
4. C2C stands for Customer to Customer.
5. ATM can be used as Electronic Fund Transfer.
6. “.com”, “.org” are domain name.
7. Credit card and Debit card are same.
8. Facebook, Twitter is examples of social networking sites.
9. Any businessman can become Online Service Provider.
10. Online market covers less geographical area.
11. Performing transaction manually is called net banking
12. Online services incur extra charge as compared to manual services.
13. Net banking is also called online banking or Internet banking.
14. You can submit applications forms using the Internet.
15. Online reservation system will let you accept booking for your services online.

Answer :

- | | | | | |
|------------|------------|-----------|-----------|------------|
| (1) False | (2) True | (3) True | (4) True | (5) True |
| (6) True | (7) False | (8) True | (9) False | (10) False |
| (11) False | (12) False | (13) True | (14) True | (15) True |

EXERCISE

- Q.1** What are the various types of E-Commerce ?
- Q.2** Differentiate between Online and Offline services
- Q.3** What is net banking ? Explain.
- Q.4** Explain the term Online Customer Support

- Q.5** Explain various Social Networking Sites.
- Q.6** What are the various modes of online Payment ?
- Q.7** What is the difference between Traditional Business and E- Business ?
- Q.8** What do you mean by Online Reservation ? Explain its advantages and disadvantages.
- Q.9** What are advantages and disadvantages of Online Shopping ?
- Q.10** What do you mean by Online Submission of Forms ?

—End—