Basic Structure of C++ Program

A C++ program basically has the following form:

1. Preprocessor Commands
2. Header Files
3. Main Functions
4. De-limiters
5. Variables
6. Statements & Expressions
7. Semi colon
8. Comments

1) Pre- Processor Commands

These commands tell the compiler to do preprocessing before doing actual compilation. Like **#include <stdio.h>** is a preprocessor command which tells a C++ compiler to include **"stdio.h"** file before going to actual compilation.

2) Header Files

Header File contains definitions of functions and variables which can be incorporated into any C++ program by using the pre-processor #include statement. Standard header files are provided with each compiler, and cover a range of areas, string handling, mathematical, data conversion, printing and reading of variables

Some Common Header Files:

File	Related Functions
Stdio.h	Standard Input/Output Functions
Conio.h	Console Input/Output Functions
Stdlib.h	Standard Library (others Functions)
Math.h	Mathematical Functions
String.h	String Related Functions

3) Main Functions

The main Functions are main building blocks of any C++ Program. Every C++ Program will have one or more functions and there is one mandatory function which is called **main( )** function. This function is prefixed with keyword **void** which means this function returns nothing value.

4) De-Limiters

   a. are the brackets {   }
   b. All the code must be enclosed within braces.

5) Variables

Variables are used to hold numbers, strings and complex data for manipulation.

6) Statements & Expressions

   a. Expressions, combine variables and constants to create new values.

   b. Statements are expressions, assignments, function calls, or control flow statements which make up the C programs.
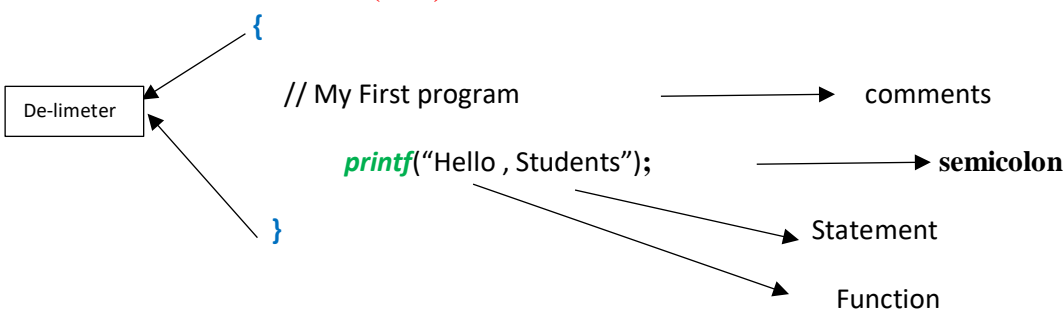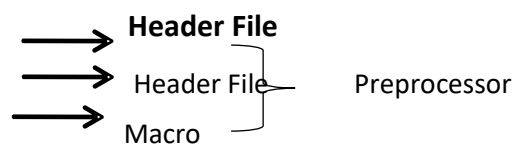
7) Semi Colon

Each and every statement must be terminate by "**;**" (semicolon).

8) Comments

   a. Used to give additional useful information inside a C Program.
   b. A comment can span through multiple lines.
   c. Single line comment : //
   d. Multiple Lines Comment: /*……..*/

Example

```
#include <stdio.h>          ────────►  Header File
#include<conio.h>           ────────►  Header File ─┐
#define PI 3.12             ────────►  Macro        ├── Preprocessor
   void main(void)                                  ─┘
   {
                // My First program   ────────►  comments
       printf("Hello , Students");    ────────►  semicolon
   }                                         Statement
                                             Function
```

De-limeter

Some basic syntax rule for C program

- C is a case sensitive language so all C instructions must be written in lower case letter.
- All C statement must be end with a semicolon.
- Whitespace is required between keywords and identifiers

Escape Sequences

An escape sequence is a sequence of characters used in formatting the output and are not displayed while printing text on to the screen, each having its own specific function. All the escape sequences in C++ are represented by 2 or more characters, one compulsorily being backslash (\) and the other any character present in the C++ character set.

Escape Sequences	Name	Description
\n	New Line	This E.S is use to cursor move at next line
\t	Tab	This E.S is use to cursor move 8 spaces forward b/w two word
\a	Bell or Beep	This E.S is use to bell sound generate or active
\r	Carriage Return	This E.S is use to cursor move at first column of current line.
\\	Backslash	This E.S is use to display Back Slash character on the screen
\0	Null	This E.S is use to terminate or decide string length.
\"	Double Quotation	This E.S is use to display Double Quotation.
\x	hex Decimal	This E.S is use to display Hex decimal code of ASCII Characters
\v	Vertical tab	This E.S is use to spaces vertical line on printer
\f	Form Feed	This E.S is use to page Eject on printer or page break

Example

```
#include <conio.h>
#include <stdio.h>
void main()
{
   clrscr();
   printf(" This is Chapter two \t\t Topic is Escape Sequences \n");
   printf(" This is Chapter two \r Topic is Escape \n");
   printf(" We use \a  beep and \" Pakistan \" ");
   printf(" here display single character ABC  by using Hex Decimal \x41 \x42 \n");
   printf(" We use \\ Pakistan \\  display only single slash  \n");
}
```

Exercise

Theory Questions

1. What do you understand by the term C++ is a "Case Sensitive Language"?
2. What is De-limiter code declaration blocks?
3. Identify the two types of comments available in C++ and indicate when each would be used.
4. What is function of *printf* statement in C++ Language?
5. Write names list of C++ program structure.

Practical Questions

1) Write a simple program to print your name on the screen.
2) Elaborate the Error(s) in the code below (if any).

```
Include<stdio.H>

Void main

{

        printf("This is MY first Lab ")

        printf("I want to be a PROGRAMMER");

}
```

3) Write down the correct code of above program.
4) Mention the output of above code.
5) Write a program to display your BIO DATA on the screen (using *printf* function and escape Sequences only)

Objective and MCQs

1) You create line comments in C++ code by adding ____ to a line you want to use a comment.
   a) ||
   b) **
   c) /*
   d) //

2) Block comments begin with /* and end with ____
   a) */
   b) /*
   c) //
   d) **

3) The rules for using a programming language are called _____.
   a) Protocols
   b) Syntax
   c) Variables
   d) Comments

4) All C++ statements must be end with a _____.
   a) Semicolon
   b) Commas
   c) Double quotations
   d) Single quotations

5) C++ keywords or function must be used in _____ case
   a) Upper case
   b) Camel case
   c) Sentence case
   d) Lower case

6) We can use C++ output statement. You chose corrects code are following.
   a) *print* " Pakistan ";
   b) *printf* " Pakistan ";
   c) *printf*(" Pakistan ");
   d) *Printf*(" Pakistan ");

7) Combine variables and constants to create new values that are called ____.
   a) Variables
   b) Statement
   c) Expression
   d) Constant

8) This Escape Sequences is use to cursor move on next line ____.
   e) \t
   f) \r
   g) \n
   h) \b

9) This Escape Sequences is use to 8 space between the two words ____.
   a) \t
   b) \r
   c) \v
   d) \n

10) This Escape Sequences is use page break or from feed on printer ____.
   a) \t
   b) \r
   c) \f
   d) \n