UNIQUE NOTES

COMPUTER 10

According to New Board Pattern

Michael Ralph Stonebraker
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10th Computer Science

UNIT 01

Introduction to Programming

Q.1 Describe introduction of programming. **10501001**

Ans: **Computer program**: Series of instructions given to the computer by human to perform particular task is called computer program. Computer program is also known as software.

Computer programming: The process of feeding or storing instructions in the computer is known as computer programming.

Programmer: The person who knows how to write a computer program correctly is known as programmer.

Programming Languages: Programmers write computer programs by using programming languages. **Example:** Java, C, C ++ , C#, Python etc.

Q.2: Why do we need a programming environment? Explain IDE with its basic tools. **10501002**

Ans: A collection of all the necessary tools for programming makes up a programming environment. It is essential to setup a programming environment before we start writing programs. It works as a basic platform for us to write and execute programs.

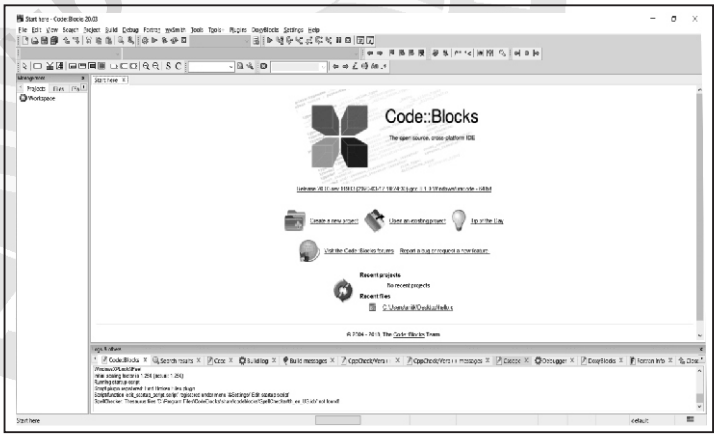
Example: For example for gardening we need gardening tools and for painting we need a collection of paints, brushes and canvas. Similarly we need proper tools for programming.

Integrated Development Environment(IDE):

Software that provides a programming environment to facilitate programmers in writing and executing computer programs is known as an Integrated Development Environment (IDE).

Feature of IDE:

- IDE is computer software that brings all the processes and tools required for program development into one place.
- IDE consists of tools that help a programmer to write, execute and test a computer program.
- C language IDE consists of text editors, compiler and debugger in a single interface.



GUI IDE

- IDE has a graphical user interface (GUI), meaning that a user can interact with it by using windows and buttons to provide input and get output.

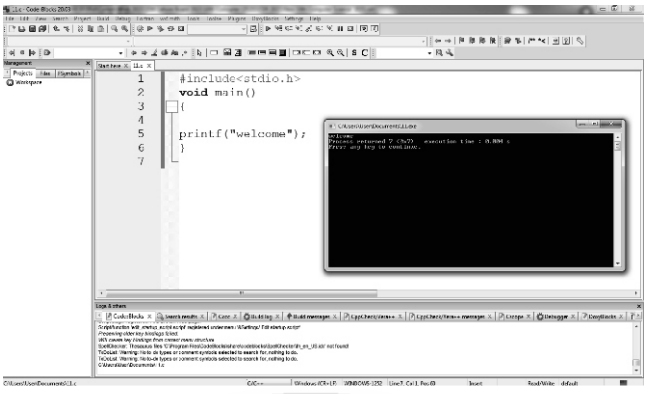
Examples

- Code:: Blocks
- Dev C++
- Visual Studio
- Xcode

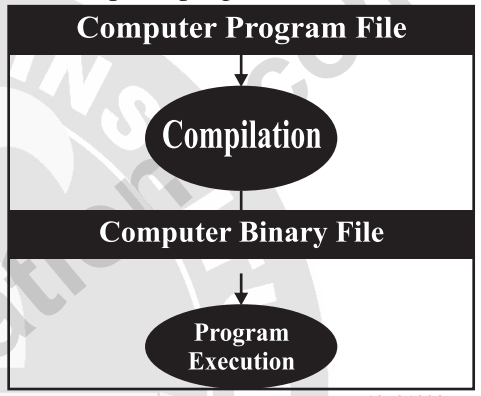
Tools of IDE

Following are the some tools of IDE:

1: Text Editor: A text editor is a software that allows programmers to write and edit computer program. All IDEs have their own specific text editor.



2: Compiler: A compiler is computer software that translates a computer program written in some high level language to machine code.



Purpose of compiler: Computers only understand and work in machine language consisting of 0s and 1s. So, machine language code is achieved by compiler.

A compiler first reads the whole program before executing it. The errors in the code are pointed out and then the machine language code is generated.

Source code: Program written in high level language is called source code

Object code: The output of compiler which consists of machine code is called object code.

Q:3 Describe syntax and syntax error. **10501003**

Ans. Syntax: The grammatical rules of a programming language to write a program are referred to as syntax of that programming language.

Each programming language has some primitive building blocks and provides some rules in order to write an accurate program. This set of rules is known as syntax of the language. Syntax can be thought of as grammar of a programming language.

Syntax error Syntax error occurs when the program violates one or more grammatical rules of the programming language.

While programming, if proper syntax or rules of the programming language are not followed, the program does not get compiled. In this case, the compiler generates an error. These kinds of errors are called syntax errors.

Q:4 What are reserved words? List of reserved words used in C language. **10501004**

Ans: Every programming language has a list of words that are predefined. Each word has its specific meaning already known to the compiler. These words are known as reserved words or keywords. These have predefined uses and cannot be used or redefined for any other purpose. If a programmer gives them a definition of his own, it causes a syntax error. Keywords cannot be used as variable names because these words are part of programming language and have special purposes in computer programs.

A complete list of reserved words used in C language is given in Fig.

reserved words (keywords)			
auto	double	int	struct
break	else	long	switch
case	enum	register	typedef
char	extern	return	union
const	float	short	unsigned

continue	for	signed	void
default	goto	sizeof	volatile
do	if	static	while

Q:5 Discuss the main parts of the structure of a C program. **(Board 2022)** **10501005**

Ans: The format according to which a program is written in C language is called the structure of a C program. We can understand the structure of a C language program, by observing the following program.

```
#include<stdio.h>
void  main( )
{
        printf("UGI");
}
```

Output
UGI

We can see that the above program can be divided into three main parts.

1. Link section or header section:

Header section or link section contains header files. Header files are collection of standard library functions to perform different tasks. These tasks include all the input/output operations and all the math operations.

The extension of header file is **.h.** While writing programs in C language, we make extensive use of functions that are already defined in the language. But before using the existing functions, we need to include the files where these functions have been defined. We include these header files in our program by writing the include statements at the top of program and start with # sign.

General structure:

```
#include<header_file_name>
```

Examples:

#include <stdio.h>
The stdio.h header file contains information about standard input-output functions.
#include <math.h>
This header file contains constants and functions to perform mathematical operations.
#include <string.h>
String library string.h has some useful functions for working with strings.
#include <conio.h>
It stands for console input/output.

2: Main section:

It consists of a main() function. Every C program must contain a main() function and it is the starting point of execution. When a C program is executed, the control goes directly to the main function.

General structure:

```
void main( )
{
        program statements …..
}
```

The word void before the function main( ) means that this function does not return a value.

3. Body of main() function:

The statements of the program are written inside the main( ) function in between the curly braces { }. These statements are the body of the program. The function body consists of a combination of different program statements that defines what the function is able to do. The main purpose of body of the function is to combine statements to be executed.

Q:6 Write rules to write syntactically correct C language programs. **10501006**

Ans: Following points must be kept in mind in order to write syntactically correct C language programs.

- Each statement ends with a semi-colon ; symbol.
- C language is a case sensitive language because the ability to distinguish uppercase or lowercase letters. i.e. *int* is different from Int. Unique and unique are two different words in C language.
- The sequence of statements in a C language program should be according to the sequence in which we want our program to be executed.

Q:7 How we add comments in C language. Explain with syntax and examples. **(Board 2023) 10501007**

Ans: Comments are used to give some additional explanation about the program if required. Comments are the statements in a program that are ignored by the compiler and do not get executed. Comments are used to provide description of our code. Usually comments are written in natural language e.g. in English language.

Purpose of writing Comments

Comments can be thought of as documentation of the program. Their purpose is dual.

- They facilitate other programmers to understand our code.
- They help us to understand our own code even after years of writing it.

Types of comments:

There are two types of comments.

- Single - line comment
- Multiple - line comment

1: Single- line comment

The // is used as single line comment. Single-line comments start with //. Anything after // on the same line, is considered a comment.

Example:

// Programme for adding two numbers.

2: Multiple - line comment

The /* .... */ is used for multiple line comments. Multi-line comment start with /* and end at */. Anything between /* and */ is considered a comment, even on multiple lines.

Example:

```
/*  Unique group
  of institutions */
```

Example:

```
#include<stdio.h>
                        // this program displays  UGI
void  main( )           /* Main section
                                from here */
{
                        // Body of main function starts from here
        printf("UGI");
}                       // Body of main function end here
```

Q:8 What is meant by character set of language? **10501008**

Ans: Character set of a language defines all characters which are valid to use in programs written in that language. Similarly in C programming language we have a character set that includes:

1) Alphabets (A, B, ……, Y,Z),(a,b…….y,z)
2) Digits (0 – 9)
3) Special symbols (~ ’ ! @ # % ^ & * ( ) _ - + = | / { } [ ] : ; “ ’ < > , . ? /)

Q:9 What are constants? Also explain its types. **10501009**

Ans: Constants

Constants are the values that cannot be changed during program execution. Constants in C are fixed values that are used in a program, and its value remains the same during the entire execution of the program e.g. 10,13, 100 etc.

In C language, primarily we have three types of constants:

1: Integer constants: The numeric values without a decimal part are called integer constants. They can be positive or negative. If the value is not preceded by a sign, it is considered as positive.

Examples: 76, -45, 100 etc.

2: Real Constants: The numeric values having a decimal part are called real constants. They can also be positive or negative.

Examples: 7.5, -8.9, 2.2 etc.

3: Character Constants: Any character written within single quotation mark is known as character constant. A character constant is a single small case letter, upper case letter, digit, punctuation mark, special symbol enclosed within single quotes (' '). The maximum length of a character constant is 1 character.

Examples: '9', '100', 'p', 'q', '!', ',' etc.

Q:10 What is a variable? Explain different data types of a variable. **(Board 2022,23)** **10501010**

Ans: A variable is actually a name given to a memory location, as the data is physically stored inside the computer's memory. The value of a variable can be changed in a program. It means that, in a program, if a variable contains value 100, then later we can give it another value that replaced the value 100.

Identifier: Each variable has a unique name called identifier.

Data type: Data type describes the type of data that can be stored in the variable.

C language has different data types such as int, float, and char.

Table shows the matching data types in C language, against different types of data.

Type of Data	Matching Data Type in C language	Sample Values
integer	int	340
real	float	3.1
character	char	'x'

Data type of a variable:

Each variable in C language has a data type. The data type not only describes the type of data to be stored inside the variable but also the number of bytes that the compiler needs to reserve for data storage.

Examples: int, float, char

1: Integer – int (signed/unsigned)

Integer data type is used to store integer values (whole numbers). Integer takes up 4 bytes of memory. We can use **int** for declaring an integer variable.

Example: int i = 2;

Signed int: A signed int can store both positive and negative values ranging from -2,147,483,648 to 2,147,483,647. By default, type **int** is considered as a signed integer.

Unsigned *int*: An unsigned *int* can store only positive values and its value ranges from 0 to +4,294,967,295. Keyword **unsigned *int*** is used to declare an unsigned integer.

2: Floating Point – float

Float data type is used to store a real number (number with floating point) up to six digits of precision. To declare a variable for type float, we use the keyword **float**. A float uses 4 bytes of memory. Its value ranges from 3.4×10^{-38} to 3.4×10^{38}.

Example: float f = 3.7;

3: Character – char

To declare character type variables in C, we use the keyword **char**. It takes up just 1 byte of memory for storage. A variable of type char can store one character only.

Example: char c = 'A';

Q:11 What is variable? Write down the rules for naming variables. 10501011

Ans: A variable is actually a name given to a memory location, as the data is physically stored inside the computer's memory. Each variable must have a unique name or identifier. Good programming practice suggests that we should give appropriate name to variable, that describes its purpose e.g. in order to store obtain marks of a student, appropriate variable name could be obt or obt_marks.

Rules for naming variables:

Following rules are used to name a variable.

- A variable name can only contain alphabets (uppercase or lowercase), digits and underscore_sign.
- Variable name must begin with a letter or an underscore(_), it cannot begin with a digit.
- A reserved word cannot be used as a variable name.
- There is no strict rule on how long a variable name should be, but we should choose a concise length for variable name to follow good design practice.

Examples: marks , subject1 , _score, father_name etc

Q:12 How can we declare and initialize a variable in C language program? 10501012

Ans: Variable Declaration

The process of specifying the variable name and its type is called variable declaration. The Variable declaration provides information to the compiler about variable. We need to declare a variable before we can use it in the program. Declaring a variable includes specifying its data type and giving it a valid name.

Syntax: data_type variable_name;

Examples:

```
int marks;
unsigned int age;
float height;
char marital_status;
```

Multiple variables of same data type may also be declared in a single statement.

Examples:

```
unsigned int obt_marks, total_marks, roll;
int a,b,c;
char marital_status , gender;
float height, per;
```

- A variable cannot be declared unless we mention its data type.
- After declaring a variable, its data type cannot be changed.
- Declaring a variable means to specify the type of variable, the range of values allowed by that variable, and the kind of operations that can be performed on it.

Example:

```
#include<stdio.h>
void main()
{
        int number;
        float height;
}
```

Variable Initialization

Assigning value to the variable for the first time is called variable initialization.

C language allows us to initialize a variable both at the time of declaration, and after declaring it. For initializing a variable at the time of declaration, we use the following general structure.

General structure: data_type variable_name = value;

Example:

```
#include<stdio.h>
void main( )
{
        int number = 100;       // variable number is declared and initialized
        float height;           // variable height is declared
        char grade = 'a';       // variable grade is declared and initialized

}
```

SOLVED EXERCISE

1. **Software that facilitates programmers in writing computer programs is known as _____.** 10501013
   (a) a compiler (b) an editor
   (c) an IDE (d) a debugger
2. **_____ is a software that is responsible for the conversion of program files to machine understandable and executable code.** 10501014
   (a) Compiler (b) Editor
   (c) IDE (d) Debugger
3. **Every programming language has some primitive building blocks and follows some grammar rules known as its _____.** 10501015
   (a) Programming rules
   (b) Syntax
   (c) Building blocks
   (d) Semantic rules
4. **A list of words that are predefined and must not be used by the programmer to name his own variables are known as:** 10501016
   (a) Auto words
   (b) Reserved words
   (c) Restricted words
   (d) Predefined words
5. **Includes statements are written in _____ section.** 10501017
   (a) Header (b) Main
   (c) Comments (d) Print
6. **_____ are added in the source code to further explain the techniques and algorithms used by the programmer.** 10501018
   (a) Messages (b) Hints
   (c) Comments (d) Explanations
7. **_____ are the values that do not change during the whole execution of program.** 10501019
   (a) Variables (b) Constants
   (c) Strings (d) Comments
8. **A float uses _____ bytes of memory.** 10501020
   (a) 3 (b) 4
   (c) 5 (d) 6
9. **For initializing a variable, we use _____ operator.** 10501021
   (a) → (b) =
   (c) @ (d) ?
10. **_____ can be thought of as a container to store constants.** 10501022
    (a) box (b) jar
    (c) variable (d) collection

ANSWERS

1.	c	**2.**	a	**3.**	b	**4.**	b	**5.**	a	**6.**	c	**7.**	b	**8.**	b
9.	b	**10.**	c												

Q.2 True or false

1. An IDE combines text editors, libraries, compilers and debuggers in a single interface. T/F **10501023**
2. Computers require the conversion of the code written in program file to machine language in order to execute it. T/F **10501024**
3. Column is a reserved word in C programming language. T/F **10501025**
4. * Comment goes here* is a valid comment. T/F **10501026**
5. float can store a real number up to six digits or precision. T/F **10501027**

ANSWERS

1	T	2	T	3	F	4	F	5	T

Q.3 Define the following:

1) IDE **10501028** 2) Compiler **10501029** 3) Reserved Words **10501030**
4) Main section of a program **10501031** 5) Char data type **10501032**

Ans: 1) IDE

A Software that provides a programming environment to facilitate programmers in writing and executing computer programs is known as an Integrated Development Environment (IDE).

2) Compiler

A compiler is a software that is responsible for conversion of a computer program written in some high programming language to machine language code. C language use compiler.

3) Reserved words

Every programming language has a list of words that are predefined. Each word has its specific meaning already known to the compiler. These words are known as reserved words or keywords.

Examples: int ,float while, for etc.

4) Main section of a program

It consists of a main( ) function. Every C program must contain a main( ) function and it is the starting point of execution. When a C program is executed, the control goes directly to the main function. General structure of main function is as follows:

```
void main (void)
{
        Program statements …..
}
```

5) char data type

To declare character type variables in C, we use the keyword char. It takes up just 1 byte of memory for storage. A variable of type char can store one character only.

Example: char grade = 'A';

Q.4 Briefly answer the following questions.

1) Why do we need a programming environment? **10501033**

Ans: A collection of all the necessary tools for programming makes up a programming environment. Programming environment provides us the basic platform to write and execute programs.

Integrated Development Environment (IDE)

Software that provides a programming environment which facilitates the programmer in writing and executing computer programs is known as an Integrated Development Environment (IDE).

C language IDE consists of text editors, compiler and debugger in a single interface.

Text editor

A text editor is software that allows programmers to write and edit computer programs. All IDEs have their own specific editors.

Compiler

A compiler is software that is responsible for conversion of a computer program written some high level programming language to machine language code. C language use compiler.

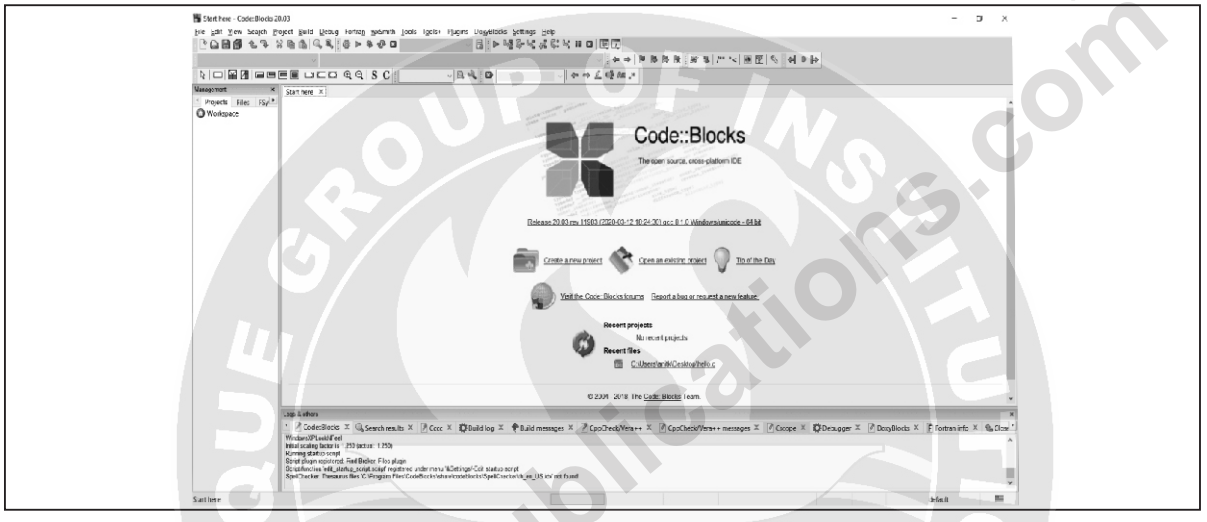
2) Write the steps to create a C program file in the IDE of your lab computer. **10501034**

Ans: Steps to install Code:: Blocks on our lab

1: Download Code:: Blocks Go to website http://www.codeblocks.org/download

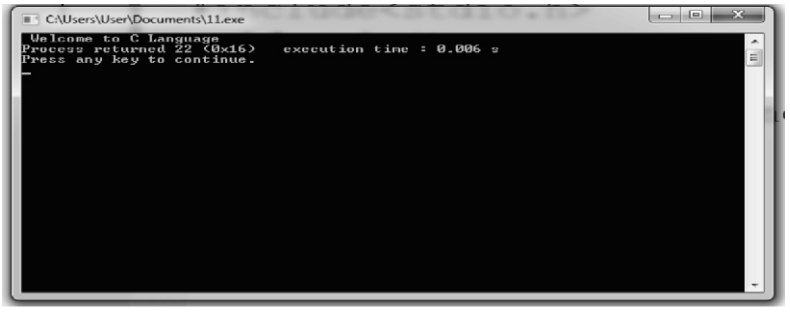
2: Install Code:: Blocks. Double click the installer.

3: Running in code:: Blocks . You will be prompted with compilers auto- detection window



- Click on **File** menu/**New/Empty file** or click **New** button to open new file.
- Click on **File** menu/**save** file or **ctrl+s** or click on **save** button. Give the name of your first C language with extension (first.c) and specify the location.

- We can click on the **Build and Run** button to see the program's output.
- A console screen showing the output is displayed, as shown in figure.



3) Describe the purpose of a compiler. **10501035**

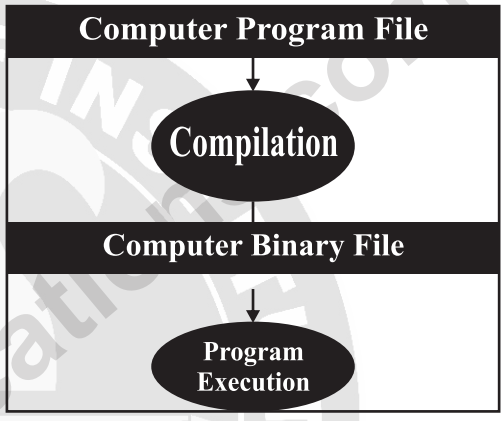
Compiler: A compiler is computer software that translates a computer program written in some high level language to machine code.

Purpose of compiler: Computers only understand and work in machine language consisting of 0s and 1s. They require the conversion of a program written in programming language, in order to execute it. This is achieved using a compiler.

A compiler first reads the whole program before executing it. The errors in the code are pointed out and then the machine language code is generated.

Source code: Program written in high level language is called source code

Object code: The output of compiler which consists of machine code is called object code.



4) List down five reserved words in C programming language. **10501036**

Ans: if , else , for , while, int, float, char etc.

5) Discuss the main parts of the structure of a C program. **10501037**

Ans: See answer Q:5

6) Why do we use comments in programming? **10501038**

Ans: See answer Q:7

7) Differentiate between constants and variables. **10501039**

Ans:

Constant	Variable
Constants are the values that do not change.	The value of a variable can be changed in a program. A variable is actually a name given to a memory location, as the data is physically stored inside the computer's memory.
Constants are usually written in numbers e.g. 3, -3.7 etc.	Variables are specially written in letters or symbols. e.g. sum, a, b etc.
The three types of constants are integer constants, real constants and character constants.	Each variable has a unique name or identifier by which we can refer to that variable, and an associated data type that describes the type of constant that can be stored in that variable.

8) Write down the rules for naming variables. **10501040**

Ans: See answer Q:11

9) Differentiate between char and int. **(Board 2023)** **10501041**

Ans:

char	int
A variable of type char can store one character only.	Integer data type is used to store integer value(Whole number)
It takes one byte of memory.	It takes four bytes of memory.
Keyword : char	Keyword : int
char = 'S';	int i =5;

10) How can we declare and initialize a variable? **10501042**

Ans: See answer Q:12

Q.5 Match the columns. **10501043**

A	B	C
1) IDE	a) machine executable code	
2) Text Editor	b) include statement	
3) Compiler	c) python	
4) Programming Language	d) CLion	
5) Reserved words	e) /* (a+b) */	
6) Link Section	f) Notepad	
7) Body of main ()	g) struct	
8) Comment	h) { }	

ANSWERS

1	d	2	f	3	a	4	c	5	g
6	b	7	h	8	e				

PROGRAMMING EXERCISES

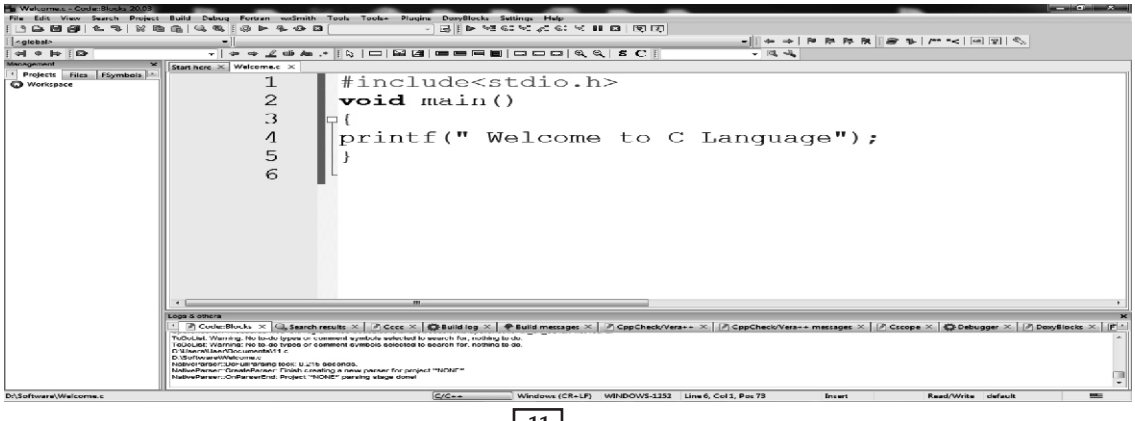
Exercise 1 **10501044**

- With the help of your teacher open the IDE installed on your lab computer for writing C programs.
- Write the following program in the editor and save it as "welcome. c".

```
# include <stdio.h>
# include <conio.h>
void main( )
 {
        printf ("Welcome to C language");
        getch( ) ;
}
```

- Run the program to see Welcome to C language printed on the screen as output.

Ans:



Exercise 2 **10501045**

Write a program that declares variables of appropriate data types to store the personal data about your best friend. Initialize these variables with the following data:

- initial letter of his name
- initial letter of his gender
- his age
- his height

Ans:

```
#include <stdio.h>
#include <conio.h>
void main( )
{
char name,gender;
int age;
float height;
name = 'A';
gender ='M';
age=18;
height=6.2;
printf("\nYOUR NAME IS: = %c",name);
printf("\nYOUR GENDER IS: = %c",gender);
printf("\nYOUR AGE IS  = %d",age);
printf("\nYOUR HEIGHT IS: = %f",height);
getch();
}
```

Output

YOUR NAME IS: = A
YOUR GENDER IS: = M
YOUR HEIGHT IS: = 6.20000

SHORT QUESTIONS

Q.1: What is computer? **10501046**

Ans. A computer is an electronic device that process data and converts in into useful information. A computer is a programmable device that stores, saves and process data.

Q.2: What are some applications of computer in our daily life? **10501047**

Ans. Some applications of computer in our daily life are following.

- They can help us to solve several problems like complex mathematical problems.
- Computer can help for searching on the internet to controlling and operating satellites and rocket launchers.
- Computers are used in education, business, online banking, communication and entertainment.

Q.3: What is computer program or software? **10501048**

Ans. Set of instructions given to the computer to perform a specific task is called computer program or software.

Q.4: What is computer programming? **(Board 2022)** **10501049**

Ans. The process of feeding or storing the instructions in the computer is known as computer programming.

Q.5: Who is computer programmer? **(Board 2022)** **10501050**

Ans. The person who knows how to write a computer program correctly is known as a programmer.

Q.6:What is meant by programming Language? **10501051**

Ans. A programming language provides the way of communication between user and computer. A computer program is written in a programming language. Programmer writes computer program in programming language.

Examples: Java, C,C++, Python etc.

Q.7: Who developed C language? **10501052**

Ans. C Language was developed by Dennis Ritchi between 1969 and 1973 at Bell Labs.

Q.8: Why we need programming environment? **10501053**

Ans.

A collection of all the necessary tools for programming makes up a programming environment. It works as a basic platform for us to write and execute programs. It is essential to setup a programming environment before we start writing programs.

Q.9: What is meant by IDE? **10501054** **(Board 2022,23)**

Ans: IDE stands for Integrated Development Environment. Software that provides a programming environment which facilitates the programmer in writing and executing computer programs is known as an Integrated Development Environment (IDE).

Q.10: Write down some of the mainly available IDEs for C programming language. **10501055**

Ans. Some of the mainly available IDEs for C programming language are as follows.

- Code: Blocks
- Visual studio
- Dev C++
- Xcode

Q.11: What do you mean by IDE has a graphical user interface (GUI)? **10501056**

Ans. An IDE has a graphical user interface (GUI), meaning that a user can interact with it using windows and buttons to provide input and get output.

Q.12: What is text editor? **(Board 2023)** **10501057**

Ans. Text editor is a software that allows programmers to write and edit computer programs. All IDEs have their own specific text editors.

Q.13: Which language understood by computer? 10501058

Ans. Computers only understand machine language which consists of binary codes 0s and 1s. Program written in programming language must be converted into machine language by using language translator.

Q.14: What is language translator? 10501059

Ans. Language translator is system software that translates programming language into machine language. Compiler, interpreter and assembler are types of language translator.

Q.15: What is compiler? 10501060

Ans. A compiler is software that is responsible for conversion of a computer program written some programming language to machine language code.

Q.16: What is the purpose of compiler? **(Board 2022)** 10501061

Ans. Computers only understand and work in machine language consisting of 0s and 1s. They require the conversion of a program written in programming language to machine language, in order to execute it. This is achieved using a compiler. A compiler is software that is responsible for conversion of a computer program written in some high level programming language to machine language code.

Q.17:What is meant by syntax? 10501062 **(Board 2023)**

Ans. The grammatical rules of a programming language to write a program are referred to as syntax of that programming language.

Q.18: What is syntax error? 10501063

Ans. While programming, if proper syntax or rules of the programming language are not followed, the program does not get compiled. In this case, the compiler generates an error. These kinds of errors are called syntax errors.

Q.19: What are reserve words or keyword? **(Board 2022)** 10501064

Ans. Every programming language has a list of words that are predefined. Each word has its specific meaning already known to the compiler. These words are known as reserved words or keywords.

Examples auto, break, do, char, case etc.

Q.20: Write down the main parts of the structure of a C program. 10501065

Ans. C program can be divided into three main parts:

- Header section or link section
- Main section
- Body of the main function

Q.21: Define header section and header files. 10501066

Ans. Header section is the part where header files are included. Header files are collection of standard library functions to perform different tasks. These tasks include all the input/output operations and all the math operations. The extension of header file is .h.

Syntax:

#include<header file name>

Examples:

#include<stdio.h>
#include<conio.h>

Q.22:Define stdio.h and math.h header files. 10501067

Ans: #include <stdio.h>

The stdio.h header file contains information about input-output functions.

#include <math.h>

This header file contains constants and functions to perform mathematical operations.

Q.23:Define string.h and conio.h header files. 10501068

Ans: #include <string.h>

String library string.h has some useful functions for working with strings.

#include <conio.h>

It stands for console input/output.

Q.24: What is the purpose of main() function in C language? 10501069

Ans. Every C program must contain a main () function and it is the starting point of execution. When a C program is executed, the control goes directly to the main function.

General structure:

```
void main ( )
{
        program statements …..
}
```

The word void before the function main( ) means that this function does not return a value

Q.25: What is the purpose of body of main() function? 10501070

Ans. The statements of the program are written inside the main( ) function in between the curly braces { }. These statements are the body of the program. The function body consists of a combination of different program statements that defines what the function is able to do. The main purpose of body of the function is to combine statements to be executed.

Q.26: What does it mean that C language is a case sensitive language? 10501071

Ans. C language is a case sensitive language because the ability to distinguish uppercase or lowercase letters. i.e. *int* is different from Int. Unique and unique are two different words in C language.

Q.27: How a C language program statement ends? 10501072

Ans: Each C language program statement ends with a semicolon (;) symbol.

Example: printf (" unique ");

Q.28: What is comment in c language? 10501073

Ans: Comments are used to give some additional explanation about the program if required. Comments are the statements in a program that are ignored by the compiler and do not get executed.

Q.29: What are two main purpose of comments in C language? **(Board 2022)** 10501074

Ans: Two purposes of comments in C language are following

- They facilitate other programmers to understand our code.
- They help us to understand our own code even after years of writing it.

Q.30: How many types of comments in C language? 10501075

Ans. There are two types of comments.

- Single line comment
- Multiple line comment

Q.31: How do we write single line comments in C language? (Board 2023) 10501076

Ans. The // is used as single line comment. Single-line comments start with //. Anything after // on the same line is considered a single comment.

Example:

// Programme for adding two numbers.

Q.32: How do we write Multiple line comments in C language? 10501077

Ans. The /* .... */ is used for multiple line comments. Multi-line comment start with /* and end at */. Anything between /* and */ is considered a comment, even on multiple lines.

Example:

/* comments are written here
Programming Language: C
Unique is always unique */

Q.33: What are character set that is used in C language? 10501078

Ans. Character set of a language defines all characters which are valid to use in programs written in that language. Similarly in C programming language we have a character set that includes:

1) Alphabets (A, B, ……, Y,Z) ,(a,b…….y,z)
2) Digits (0 – 9)
3) Special symbols (~ ’ ! @ # % ^ & * ( ) _ - + = | / { } [ ] : ; “ ’ < > , . ? /)

Q.34: What is constant? 10501079

Ans. A constant is a quantity which value cannot be changed. Constants are usually written in numbers e.g. 10, 13, 100 etc.

Q.35: How many types of constant in C language? 10501080

Ans. In C language, primarily we have three types of constants.

- Integer constants
- Real constants
- Character constants

Q.36: What are integer constants? 10501081

Ans. The numeric values without a decimal part are called integer constants.
They can be positive or negative. If the value is not preceded by a sign, it is considered as positive.

Examples: Some examples of integer constants are 76, -45, 100 etc.

Q.37: What are Real constants? 10501082

Ans. The numeric values having a decimal part are called real constants. They can also be positive or negative.

Examples: 7.5, -8.9, 2.2 etc.

Q.38: What are character constants? 10501083

Ans. Any single small case letter, upper case letter, digit, punctuation mark, special symbol enclosed within ‘ ’ is considered a character constant e.g. ‘9’, ‘100’, ‘p’, ‘q’, ‘!’, ‘,’ etc.

Q.39: What is a variable? 10501084

Ans. A variable is actually a name given to a memory location, as the data is physically stored inside the computer’s memory. The value of a variable can be changed in a program. It means that, in a program, if a variable contains value 100, then later we can give it another value that replaced the value 100.

Q.40: What is Identifier? 10501085

Ans. Each variable has a unique name which is called identifier.

Examples:

int sum
char name
Here sum and name are identifiers

Q.41: What is the use of data types in variable? 10501086

Ans. Data type describes the type of data that can be stored in the variable.
C language has different data types such as int, float, and char. The data types int, float and char are used to store integer, real and character data respectively.

Q.42: Demonstrate the matching data types in C language, against different types of data. 10501087

Ans. Following table shows the matching data types in C language, against different types of data.

Type of Data	Matching Data Type in C language	Sample Values
integer	int	340
real	float	3.1
character	char	‘x’

Q.43: What do you mean by data type of a variable? 10501088

Ans. Each variable in C language has a data type. The data type not only describes the type of data to be stored inside the variable but also the number of bytes that the compiler needs to reserve for data storage. Following are different data types provided by C language.

- Integer – int
- Floating point – float
- Character – char

Q.44: What is integer data types? Mention its types. 10501089

Ans. Integer data type is used to store integer values (whole numbers). Integer takes up 4 bytes of memory. We can use **int** for declaring an integer variable. There are two types of integer data types.

- Signed *int*.
- Unsigned *int*.

Q.45: What is the use of signed int data types? 10501090

Ans. A signed *int* can store both positive and negative values ranging from –2,147,483,648 to 2,147,483,647. By default, type *int* is considered as a signed integer.

Q.46: What is the use of Unsigned int data types? 10501091

Ans. An unsigned *int* can store only positive values and its value ranges from 0 to +4,294,967,295. Keyword unsigned *int* is used to declare an unsigned integer.

Q.47: What is the use of float point – float data types? 10501092

Ans. Float data type is used to store a real number (number with floating point) up to six digits of precision. To declare a variable for type float, we use the keyword float. A float uses 4 bytes of memory. Its value ranges from 3.4×10^{-38} to 3.4×10^{38}.

Q.48: What is the use of character data type? 10501093

Ans. To declare character type variables in C, we use the keyword **char**. It takes up just 1 byte of memory for storage. A variable of type char can store one character only.

Q.49: Write down the rules for naming variables. 10501094

Ans. Following rules are used for name variable.

- A variable name can only contain alphabets (uppercase or lowercase), digits and underscore sign.
- Variable name must begin with a letter or an underscore, it cannot begin with a digit.
- A reserved word cannot be used as a variable name.
- There is no strict rule on how long a variable name should be, but we should choose a concise length for variable name to follow good design practice.

Q.50: What do you mean by variable declaration in C language? 10501095

Ans. The Variable declaration provides information to the compiler about variable. We need to declare a variable before we can use it in the program. The process of specifying the variable name and its type is called variable declaration.

Q.51: How we declare the variable in C language? **(Board 2023)** 10501096

Ans. We need to declare a variable before we can use it in the program. Declaring a variable includes specifying its data type and giving it a valid name.

Syntax: data_type variable_name;

Examples:

```
int marks;
unsigned int age;
```

Q.52: What are important points you should remember during variable declaration? 10501097

Ans.

- A variable cannot be declared unless we mention its data type.
- After declaring a variable, its data type cannot be changed.
- Declaring a variable specific the type of variable, the range of values allowed by that variable, and the kind of operations that can be performed on it.

Q.53: What do you meant by variable initialization? 10501098

Ans. Assigning value to variable for the first time is called variable initialization.

C language allows us to initialize a variable both at the time of declaration, and after

declaring it.

Syntax: data_type variable_name = value;

Q.54: Is a digit used as character constant is different from a digit used as an integer constant. 10501099

Ans. Yes, a digit used as character constant is different from a digit used as an integer constant.

Example: A digit used as character constant i.e '9' is different from a digit used as an integer constant i.e 9. We can add two integer constants to get the obvious mathematical result e.g 9+8 = 17, but we cannot add a character constant to another character constant to get the obvious mathematical result e.g '9'+ '8' ≠17.

Q.55: What is range of int value in the compiler that uses two bytes memory? 10501100

Ans. Some compiler use two bytes of memory to store an int value. In such compilers ,an int value ranges from -32,768 to 32,768.

Q.56: What is good programming practice when you write variable name? 10501101

Ans. Good programming practice suggests that we should give appropriate name to variable, that describes its purpose e.g. In order to store salary of a person ,appropriate variable name could be salary or wages.

Q.57: What is a string? 10501101 (a)

Ans. A collection of characters is called string.
Example: char str[12] = "Hello";

MULTIPLE CHOICE QUESTIONS

Choose the correct answers:

1. **Set of instructions given to the computer to perform a specific task is known as:** 10501102
   (a) Computer program (b) Software
   (c) Both a and b (d) none of theses
2. **The process of feeding or storing the instructions in the computer is known as:** 10501103
   (a) Computer program (b) Software
   (c) Hardware (d) Computer programming
3. **The person who knows how to write a computer program correctly is known as:** 10501104
   (a) Programmer (b) Firmware
   (c) Engineer (d) Composer
4. **Computer programs are written in languages called:** 10501105
   (a) Developer
   (b) Software
   (c) Engineer
   (d) Programming languages
5. **A collection of all the necessary tools for programming makes up a:** 10501106
   (a) Tools
   (b) Programming environment
   (c) Designer
   (d) Programming languages
6. **Which provides us the basic platform to write and execute programs?** 10501107
   (a) Tools
   (b) Programming environment
   (c) Designer
   (d) Programming languages
7. **Software that provides a programming environment and facilitates the programmer in writing and executing computer programs is known as:** 10501108
   (a) IDE (b) Block
   (c) Software (d) Designer
8. **Software that allows programmers to write and edit computer programs:**
   (a) Software (b) Code 10501109
   (c) Programmer (d) Text editor
9. **Which is software that is responsible for conversion of a computer program written in some programming language to machine language code?** 10501110
   (a) Header (b) Compiler
   (c) Programmer (d) Text editor
10. **Every programming language has some primitive building blocks and follows some grammar rules known as:**
    (a) Rules (b) Signs 10501111
    (c) Blocks (d) Syntax

11. Words which have predefined meaning is known as: 10501112
(a) Reserved words (b) Keywords
(c) Both a and b (d) Syntax

12. How many parts C language program is divided? 10501113
(a) 1 (b) 2
(c) 3 (d) 4

13. Which is a part where header files are included? 10501114
(a) Header section (b)Main section
(c) Body section (d) Full section

14. Which section corresponds to the main function and the body of the main function? 10501115
(a) Header (b) Main
(c) Body (d) Full

15. In main function everything enclosed in: 10501116
(a) Body (b) Include files
(c) Body (d)Curly braces

16. Statements that are ignored by the compiler and do not get executed. 10501117
(a) Read only (b) Comments
(c) Enclosed in braces (d)Curly braces

17. Which are used to include additional information about the program? 10501118
(a) Comments (b) Read only
(c) Colon (d) Underscore

18. Which are the values that do not change? 10501119
(a) Constants (b) Variables
(c) Numeric (d) String

19. How many types of constant? 10501120
(a) 1 (b) 2
(c) 3 (d) 4

20. Which of the following are types of constant? 10501121
(a) Integer constants
(b) Real constants
(c) Character constants
(d) All of these

21. What is the name given to a memory location as the data is physically stored inside the computer's memory? 10501122
(a) Constant
(b) Real constants
(c) Character constants
(d) Variable

22. Each variable has a unique name called: 10501123
(a) Identifier
(b) Simple name
(c) Formula
(d) constant

23. Which from the following describes the type of constant that can be stored in variable? 10501124
(a) Character (b) Data type
(c) Variable (d) Constant

24. A ____ must be declared before its use. 10501125
(a) Character (b) Data type
(c) Variable (d) Constant

25. _____includes specifying variable's data type and giving it a valid name.
(a) Identifier 10501126
(b) Variable declaration
(c) Formula
(d) Constant

26. Assigning value to variable for the first time is called: 10501127
(a) Initiation
(b) Variable initialization
(c) Variable
(d) String constant

27. The _____ can be initialized at the time of declaration or after declaration.
(a) Character (b) Data type 10501128
(c) Variable (d) Constant

28. Programmers write computer programs in special languages called:
(a) General languages 10501129
(b) Programming languages
(c) Popper languages
(d) Constant

29. A_____ has a graphical user interface (GUI), meaning that a user can interact with it using windows and buttons to provide input and get output. 10501130
(a) IDE (b) Programming
(c) EDA (d) Constant

30. An _____consists of tools that help a programmer throughout the phases of writing, executing and testing a computer program. 10501131
(a) DBA (b) IDE
(c) EDP (d) Editor

31. Which of the following is an example of IDEs for C language? 10501132
(a) Visual Studio (b) Xcode
(c) Code:: Blocks (d) All of these

32. ____ editor is a software that allows programmers to write and edit computer programs. 10501133
(a) Text (b) MS Word
(c) Power point (d) Notepad

33. Main screen of an ____ where we can write our programs. 10501134
(a) DBA (b) IDE
(c) EDP (d) Editor

34. C language program is written in the text editor of IDE____. 10501135
(a) Text (b) MS Word
(c) Power point (d) code::Blocks

35. Which languages is understood by computer? 10501136
(a) Machine language
(b) Assembly language
(c) High level language
(d) Middle level language

36. Which is used to convert high level programming language into machine language?
(a) Compiler 10501137
(b) C language
(c) Code programming
(d) Internal programming

37. Which can be thought of as grammar of a programming language? 10501138
(a) Syntax (b) Rules
(c) English (d) Programming

38. Which error occurs while programming, if proper syntax or rules of the programming language are not followed? 10501139
(a) Logical error (b) Runtime error
(c) English error (d) Syntax error

39. Words which have special meaning in language are called: 10501140
(a) Simple word (b) Common words
(c) English word (d) Reserved words

40. Which section contains header files?
(a) Header section (Link section) 10501141
(b) Main section
(c) Reserve section
(d) Body section

41. We include header files in our program by writing the include statements at ____ of program. 10501142
(a) Top (b) Middle
(c) End (d) Section

42. Which header file includes file that contains information related to input and output functions? 10501143
(a) math.h (b) stdio.h
(c) string.h (d) c.h

43. Header file is started from ___ symbol.
(a) # (b) $ 10501144
(c) & (d) =

44. Which header file contains all predefined mathematical functions?
(a) math.h (b) stdio.h 10501145
(c) strin.h (d) c.h

45. Main section consists of a _____ function. 10501146
(a) main() (b) body()
(c) both a and b (d) center()

46. Which is the starting point of the execution of the program? 10501147
(a) main() (b) body()
(c) end() (d) center()

47. All the statements inside these _____make the body of main function.
(a) {} (b) () 10501148
(c) ?? (d) ==

48. C language is: 10501149
(a) Top sensitive (b) Case sensitive
(c) End sensitive (d) Section sensitive

49. Each statement ends with: 10501150
(a) ; (b) :
(c) , (d) =

50. Which are the statements in a program that are ignored by the compiler? 10501151
(a) Comments
(b) Common verb
(c) End sensitive
(d) Section sensitive

51. Which facilitate other programmers to understand our code? 10501152
(a) Common words
(b) Comments
(c) End sensitive
(d) Section sensitive

52. Which help us to understand our own code even after years of writing it? 10501153
(a) Common words
(b) Comments
(c) End sensitive
(d) Section sensitive

53. How many types of comments in C language are? 10501154
(a) 1 (b) 2
(c) 3 (d) 4

54. Single-line comments start with: 10501155
(a) // (b) ==
(c) ?? (d) &&

55. Multi-line comments start with: 10501156
(a) ?* and end at *?
(b) /==/
(c) /??/
(d) /* and end at */

56. These are the values without a decimal point. 10501157
(a) Integer Constants
(b) String constants
(c) Character constants
(d) Single constants

57. If the value is not proceeded by a sign, it is considered: 10501158
(a) Negative (b) Positive
(c) Module (d) Single constants

58. These are the values including a decimal point. 10501159
(a) Real Constants
(b) String constants
(c) Character constants
(d) Single constants

59. Any single small case letter, upper case letter, digit, punctuation mark, special symbol enclosed within ' ' is considered a: 10501160
(a) Integer Constants
(b) String constants
(c) Character constant
(d) Single constants

60. How many bytes of memory is used by integer data type? 10501161
(a) 1 (b) 2
(c) 3 (d) 4

61. Which keyword is used for integer data type? 10501162
(a) int (b) float
(c) char (d) double

62. A signed *int* can store both positive and negative values ranging from: 10501163
(a) -2,147,483,648 to 2,147,483,647
(b) 3,147,483,648 to 2,147,483,747
(c) 7,147,483,648 to 2,147,483,647
(d) 8,147,483,648 to 2,147,483,647

63. By default, type *int* is considered as:
(a) Signed integer 10501164
(b) Negative integer
(c) Positive integer
(d) Original integer

64. An _____can store only positive values and its value ranges from 0 to +4,294,967,295. 10501165
(a) Unsigned int (b) Negative int
(c) Positive int (d) Integer

65. Keyword unsigned int is used to declare an____ integer. 10501166
(a) Signed (b) Negative integer
(c) Unsigned (d) Original integer

66. Which data type is used to store a real number? 10501167
(a) float (b) Negative integer
(c) Unsigned (d) Original integer

67. Floating point numbers store numbers up to: 10501168
(a) Seven digits of precision
(b) Eight digits of precision
(c) Ten digits of precision
(d) Six digits of precision

68. Which keyword is used to declare the floating type variable? 10501169
(a) int (b) float
(c) Positive (d) char

69. How many bytes are used by float type variable? 10501170
(a) 1 (b) 2
(c) 3 (d) 4

70. The value ranges of floating point is:
(a) 3.4×10^{-38} to 3.4×10^{38} 10501171
(b) 5.4×10^{-38} to 3.4×10^{38}
(c) 4.4×10^{-38} to 3.4×10^{38}
(d) 6.4×10^{-38} to 3.4×10^{38}

71. To declare character type variables in C, we use the keyword: 10501172
(a) int (b) float
(c) Positive (d) char

72. How many characters can be stored in a char type variable? 10501173
(a) 1 (b) 2
(c) 3 (d) 4

73. Which name must begin with a letter or an underscore, it cannot begin with a digit? 10501174
(a) Character (b) Constant
(c) String (d) Variable

74. A _____cannot be used as a variable name. 10501175
(a) Reserved word
(b) Simple words
(c) String words
(d) Reserved Variable

75. Which of the following is not a valid variable name? 10501176
(a) height (b) average
(c) 9A (d) f_name

76. We need to declare a _____before we can use it in the program. 10501177
(a) variable (b) constant
(c) string (d) underscore

77. _____includes specifying its data type and giving it a valid name. 10501178
(a) Variable
(b) Constant
(c) String
(d) Declaring a variable

78. Multiple variables of same data type may also be declared in a: 10501179
(a) Multiple
(b) Single statement
(c) Many
(d) Multiple variable

79. _____cannot be declared unless we mention its data type. 10501180
(a) Variable
(b) Constant
(c) String
(d) Declaring a variable

80. _____ Specifies the type of variable, the range of values allowed by that variable and the kind of operations that can be performed on it. 10501181
(a) Variable
(b) Constant
(c) String
(d) Declaring a variable

81. Which language was developed by Dennis Ritchie? 10501182
(a) Java (b) C
(c) Python (d) COBOL

82. C language was developed in: 10501183
(a) 1969 - 1973 (b) 1990 - 2000
(c) 1955 - 60 (d) 1970 - 80

83. GUI stands for: 10501184
(a) Graphical User Interface
(b) User Interface
(c) Global User Interface
(d) Grammar interface

84. Which one is not IDE? 10501185
(a) X code (b) Dev. c++
(c) Visual studio (d) python

85. How many keyword(Reserve words) are? 10501186
(a) 28 (b) 29
(c) 32 (d) 31

86. The execution of program starts from: 10501187
(a) main section (b) header section
(c) header file (d) #include

87. Header files have extension. 10501188
(a) .c (b) .h
(c) .doc (d) .ppt

88. The conversion of program file into binary file is called: 10501189
(a) Editing (b) Compilation
(c) Linking (d) Execution

89. In C language main( ) is a: 10501190
(a) function (b) code
(c) editor (d) library

90. Which of the following is header file?
(a) void main( ) (b) getch( ) 10501191
(c) #include<stdio.h> (d) None of these

91. The process of running a program is called: 10501192
(a) Debugging (b) compiling
(c) Execution (d) Using

92. Which extension is used to save C language program? 10501193
(a) .doc (b) .c
(c) .xls (d) .dat

93. A program written in high level language is called: 10501194
(a) source code (b) object code
(c) normal code (d) binary code

94. Output of compiler is called: 10501195
(a) source code (b) object code
(c) binary code (d) both b and c

95. Which of the following detect syntax error? 10501196
(a) Compiler (b) reader
(c) binary code (d) both b and c

ANSWERS

1.	c	**2.**	d	**3.**	a	**4.**	d	**5.**	b	**6.**	b	**7.**	a
8.	d	**9.**	b	**10.**	d	**11.**	c	**12.**	c	**13.**	a	**14.**	b
15.	d	**16.**	b	**17.**	a	**18.**	a	**19.**	c	**20.**	d	**21.**	d
22.	a	**23.**	b	**24.**	c	**25.**	b	**26.**	b	**27.**	c	**28.**	b
29.	a	**30.**	b	**31.**	d	**32.**	a	**33.**	b	**34.**	d	**35.**	a
36.	a	**37.**	a	**38.**	d	**39.**	d	**40.**	a	**41.**	a	**42.**	b
43.	a	**44.**	a	**45.**	c	**46.**	a	**47.**	a	**48.**	b	**49.**	a
50.	a	**51.**	b	**52.**	b	**53.**	b	**54.**	a	**55.**	d	**56.**	a
57.	b	**58.**	a	**59.**	c	**60.**	d	**61.**	a	**62.**	a	**63.**	a
64.	a	**65.**	c	**66.**	a	**67.**	d	**68.**	b	**69.**	d	**70.**	a
71.	d	**72.**	a	**73.**	d	**74.**	a	**75.**	c	**76.**	a	**77.**	d
78.	b	**79.**	a	**80.**	d	**81.**	b	**82.**	a	**83.**	a	**84.**	d
85.	c	**86.**	a	**87.**	b	**88.**	b	**89.**	a	**90.**	c	**91.**	c
92.	b	**93.**	a	**94.**	d	**95.**	a						

ACTIVITIES

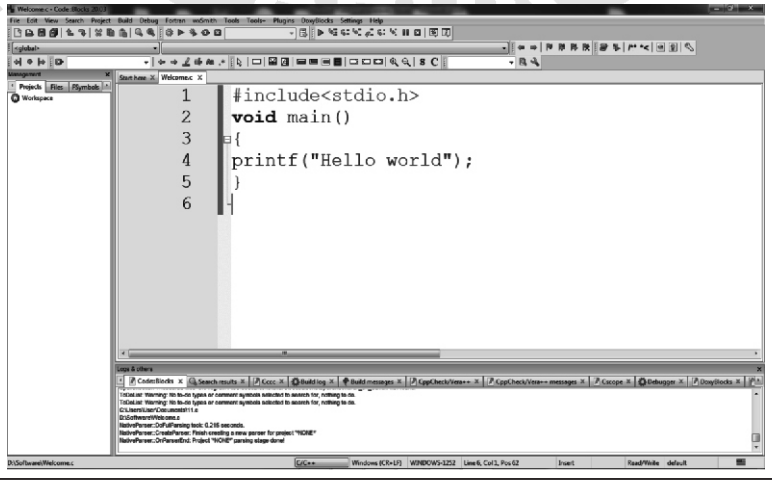
Activity 1.1 Use your web browser to find out the names of three different IDEs that can be used for C programming language. 10501197

Ans: Names of three different IDEs that can be used for C programming language.

- Code lite
- Sublime Text
- NetBeans
- Atom

Activity 1.2 Open the IDE install on your lab computer. Write the program Hello world in the text editor of your IDE and execute it. 10501198

Ans:



Activity 1.3 From the following list, encircle the reserved words in C language: 10501199

int ,pack ,create ,case ,return ,small ,math ,struct ,program ,library

Ans: From the above list, following are reserve words in C language.

- int
- case
- return
- struct

Activity 1.4 Identify different parts of the following C language: 10501200

```
#include<stdio.h>
#include<conio.h>
void main( )
{
        printf(" I am a student of class 10th");
        getch();
}
```

Ans: Different parts of the above C language program are:

1: Link section or Header section

```
#include<stdio.h>
#include<conio.h>
```

2: Main Section

```
void main()
```

3: Body of main( ) function

```
{
        printf(" I am a student of class 10th");
        getch();
}
```

Activity 1.5 Tick valid comments among the following: 10501201

- *comment goes here*
- /*comment goes Here*/
- %comment goes here%
- /*comment goes here/
- //comment goes here*/

Ans: /*comment goes Here*/

Activity 1.6 Identify the type of constant for each of the following values. 10501202

12	**1.2**	**'+'**	**- 21**	**32.768**
'a'	**-12.3**	**41**	**40.0**	**'\'**

Ans: Different type of constant from the above list.

Integer constant	Real constant	Character constant
12	1.2	'*'
-21	32.768	'a'
41	-12.3	'\'
	40.0	'+'

Activity 1.7 **Encircle the valid variable names among the following.** 10501203

_Hello	**1var**	**roll_num**	**Air23Blue**	**float**
Case	**$car**	**name**	**=color**	**Float**

Ans: Valid variable names among above list are as follow:

- _Hello
- roll_num
- Air23Blue
- name
- Case
- Float

Activity 1.8 **Write a program that declares variables of appropriate data type to store your personal data. Initialize these variables with the following data.** 10501204

- **Initialize letter of your name**
- **Initialize letter of your gender**
- **Your age**
- **Your marks in 8th class**
- **Your height**

Ans:

```
#include<stdio.h>
#include<conio.h>
void main( )
{
char name,gender;
int age, marks;
float height;
name = 'z';
gender = 'm';
age = 15;
marks = 420;
height = 5.5;
printf("\n Your Name is = %c",name);
printf("\n Your Gender is = %c",gender);
printf("\n Your Age is = %d",age);
printf("\n Your Marks is = %d",marks);
printf("\n Your height is = %f",height);
getch( );
}
```

Output

Your Name is = z
Your Gender is = m
Your Age is = 15
Your Marks is = 420
Your height is = 5.500000