

# V V COLLEGE OF ENGINEERING

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## OCS752 – Introduction to C Programming

Unit 1 to 5

Two Marks with Answers

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## Unit I

### **1. What is Token?**

Token is a building block of a program. A C program consists of various tokens and a token is either a keyword, an identifier, a constant, a string literal, or a symbol.

### **2. What is Keyword?**

Keywords are special reserved words associated with some meaning.

### **3. What is keyword auto for?**

By default, every local variable of the function is automatic (auto). In the below function both the variables “x” and “y” are automatic variables.

```
void fun()
{
    int x, auto int q;
}
```

### **4. What are main characteristics of C language?**

C is a procedural language. The main features of C language include low-level access to memory, simple set of keywords, and clean style. These features make it suitable for system programming like operating system or compiler development.

### **5. What are reserved words?**

Reserved words are words that are part of the standard C language library. This means that reserved words have special meaning and therefore cannot be used for purposes other than what it is originally intended for. Examples of reserved words are float, default, and return.

### **6. What are the types of C tokens?**

- C tokens are of six types. They are,
- Keywords (eg: int, while)
- Identifiers (eg: main, total)
- Constants (eg: 10, 20)
- Strings (eg: “total”, “hello”)
- Special symbols (eg: (), {})
- Operators (eg: +, /,-,\*)

### **7. What is the use of printf() and scanf()?**

**printf():**

The printf() function is used to print the integer, character, float and string values on to the screen. Following are the format specifier:

%d: It is a format specifier used to print an integer value.

%s: It is a format specifier used to print a string.

%c: It is a format specifier used to display a character value.

%f: It is a format specifier used to display a floating point value.

**scanf():**

The scanf() function is used to take input from the user.

**8. What is data types in C?**

- Data types in C language are defined as the data storage format that a variable can store a data to perform a specific operation.
- Data types are used to define a variable before to use in a program.
- Size of variable, constant and array are determined by data types.

**9. What is typecasting?**

The typecasting is a process of converting one data type into another is known as typecasting. If we want to store the floating type value to an int type, then we will convert the data type into another data type explicitly. (type-name) expression .

**10. What is the difference between variable declaration and variable definition?**

Declaration associates type to the variable whereas definition gives the value to the variable.

**11. What are global variable and how do you declare them?**

Global variables are variables that can be accessed and manipulated anywhere in the program. To make a variable global, place the variable declaration on the upper portion of the program, just after the pre\_processor directives section.

**12. What is local variable in C ?**

The variables which are having scope/life only within the function are called local variables. These variables are declared within the function and can't be accessed outside the function.

**13. What is constant in C?**

Constants refer to fixed values. They are also called as literals.

C Constants are also like normal variables. But, only difference is, constant values can't be modified by the program once they are defined. Constants may be belonging to any of the data type.

#### **14. What are the types of constants in C?**

- Integer constants
- Real or Floating point constants
- Octal & Hexadecimal constants
- Character constants
- String constants
- Backslash character constants

#### **15. What is the difference between = and == symbol?**

The = symbol is often used in mathematical operations. It is used to assign a value to a given variable. On the other hand, the == symbol, also known as "equal to" or "equivalent to", is a relational operator that is used to compare two values.

#### **16. Describe the order of precedence with regards of operator in C.**

Order of precedence determines which operation must first take place in an operation statement or conditional statement. On the top most level of precedence are the unary operators !, +, - and &. It is followed by the regular mathematical operators (\*, / and modulus % first, followed by + and -). Next in line are the relational operators <, <=, >= and >. This is then followed by the two equality operators == and !=. The logical operators && and || are next evaluated. On the last level is the assignment operator =.

#### **17. What is the difference between pre-increment operator and post increment operator?**

Pre increment operator is used to increment variable value by 1 before assigning the value to the variable. Post increment operator is used to increment variable value by 1 after assigning the value to the variable.

#### **18. What are all decision control statement in C?**

There are 3 types of decision making control statements in C language. They are,

1. if statements
2. if else statements
3. nested if statements

#### **19. What will happen if break statement is not used in switch case in C?**

Switch case statements are used to execute only specific case statements based on the switch expression. If we do not use break statement at the end of each case, program will execute all consecutive case statements until it finds next break statement or till the end of switch case block.

**20. What is nested loop?**

A nested loop is a loop that runs within another loop. Put it in another sense, you have an inner loop that is inside an outer loop. In this scenario, the inner loop is performed a number of times as specified by the outer loop. For each turn on the outer loop, the inner loop is first performed.

**21. What is the difference between while and do...while loop in C?**

While loop is executed only when given condition is true. Whereas, do-while loop is executed for first time irrespective of the condition. After executing while loop for first time, then condition is checked.

## Unit II

### 1) What is an Array in C language.?

A group of elements of same data type.

### 2) In genral what is correct statement about C language arrays.

An array address is the address of first element of array itself. An array size must be declared if not initialized immediately. Array size is the sum of sizes of all elements of the array.

### 3) What are the Types of Arrays.?

Types of arrays includes;

- int, long, float, double
- struct, enum and
- char

### 4) How do An array Index starts with?

It always starts with 0.

### 6) What is the output of C Program.?

```
int main()
{
    int a[]; a[4] = {1,2,3,4};
    printf("%d", a[0]);
}
```

Output will be a Compiler error

### 7) What is the output of C Program.?

```
int main()
{
    int a[] = {1,2,3,4};
    int b[4] = {5,6,7,8};
    printf("%d,%d", a[0], b[0]);
}
```

Output will be 1,5

### 8) What is the output of C Program.?

```
int main()
{
    char grade[] = {'A','B','C'};
```

```
printf("GRADE=%c, ", *grade);
printf("GRADE=%d", grade);
}
```

Output will be GRADE=A, GRADE=some address of array

**9) What is the output of C program.?**

```
int main()
{
    char grade[] = {'A','B','C'};
    printf("GRADE=%d, ", *grade);
    printf("GRADE=%d", grade[0]);
}
```

The output will be 65 65

**10) What is the output of C program.?**

```
int main()
{
    float marks[3] = {90.5, 92.5, 96.5};
    int a=0; while(a<3)
    {
        printf("%.2f,", marks[a]); a++;
    }
}
```

The resultant value will be 90.5 92.5 96.5

**11) What is the output of C Program.?**

```
int main()
{
    int a[3] = {10,12,14};
    a[1]=20; int i=0;
    while(i<3)
    {
        printf("%d ", a[i]); i++;
    }
}
```

The output will be 10 20 14

Explanation:  $a[i]$  is  $(i+1)$  element. So  $a[1]$  changes the second element.

**12) What is an array Base Address in C language.?**

Base address in c include

A) Base address is the address of 0th index element.

B) An array  $b[]$  base address is  $\&b[0]$

C) An array  $b[]$  base address can be printed with `printf("%d", b);`

**13) What is the output of C Program with arrays and pointers.?**

```
int main()
{
    int a[3] = {20,30,40};
    change(a);
    printf("%d %d", *a, a[0]);
}
void change(int a[])
{
    a[0] = 10;
}
```

Output: 10 10

Explanation: Notice that function `change()` is able to change the value of  $a[0]$  of `main()`. It uses Call By Reference. So changes in called function affected the original values.

**14) Define an 2D array in C with two difference egs.?**

C looks a two dimensional array as an array of a one dimensional array. The 2-D array be visualized as a rectangular grid of rows and columns.

**15) What is multi-dimensional array?**

An array with more than one subscript is called multi-dimensional array. In General an array with  $n$  subscripts is called  $n$ -dimensional array



### Unit III

#### **1. What is the difference between „a“ and “a”?**

“a” is a character constant and “a” is a string.

#### **2. What is the use of “\0” character?**

When declaring character arrays (strings), „\0“ (NULL) character is automatically added at end. The „\0“ character acts as an end of character array.

#### **3. Define Strings.**

The group of characters, digit and symbols enclosed within quotes is called as String (or) character Arrays. Strings are always terminated with „\0“ (NULL) character. The compiler automatically adds “\0” at the end of the strings.

Example for character arrays [strings].

```
#include <stdio.h>main()
{
    static char name1[] = {'H','e','l','l','o'};
    static char name2[] = "Hello";
    printf("%s\n", name1);
    printf("%s\n", name2);
}
```

#### **4. List the different methods for reading and writing a string.**

The different methods for reading a string are,

```
scanf()
gets()
getchar()
getch() or getche()
```

#### **5. Write a C program to get a string input and print it.**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    char str[20];
    gets(str);
    printf("The given string\n");
}
```

```
        printf("%s",str);
    }
```

Output :

The given string Excellent

#### 6. What is the use of gets() function?

The gets() function allows a full line entry from the user. When the user presses the enter key to end the input, the entire line of characters is stored to a string variable.

#### 7. Write a C program to find the length of given string.

```
#include <stdio.h>
int main()
{
    char s[1000], i;
    printf("Enter a string: ");
    scanf("%s", s);
    for(i = 0; s[i] != '\0'; ++i)
        printf("Length of string: %d", i);
    return 0;
}
```

#### Output:

Enter a String:

Hai Programming in C

Length of String :16

#### 8. Why is it necessary to give the size of an array in an array declaration?

When an array is declared, the compiler allocates a base address and reserves enough space in the memory for all the elements of the array. The size is required to allocate the required space.

Thus, the size must be mentioned.

#### 9. What is the use of gets() function?

The gets() function allows a full line entry from the user. When the user presses the enter key to end the input, the entire line of characters is stored to a string variable.

#### 10. What is pointer?

Every variable in C has a name and a value associated with it. When a variable is declared, a specific block of memory within the computer is allocated to hold the value of that variable. The

size of the allocated block depends on the data type. A pointer is a variable that contains the address of another variable.

### **11. How to declaring pointer variables?**

The general syntax of declaring pointer variables can be given as below.

**data\_type \*ptr\_name;**

### **12. Define pointer to pointer.**

The pointers in turn point to data or even to other pointers. To declare pointer to pointer, just add an asterisk \* for each level of reference.

### **13. Write the drawbacks of pointers.**

Pointers are very useful in C, they are not free from limitations. If used incorrectly, pointers can lead to bugs that are difficult to unearth.

Example: If you use a pointer to read a memory location but that pointer is pointing to an incorrect location, then you may end up reading a wrong value. An erroneous input always leads to an erroneous output.

Thus however efficient our program code may be, the output will always be disastrous.

## Unit IV

### 1. What is Function?

A function definition in C programming consists of a function header and a function body.

Return Type – A function may return a value.

### 2. List out the type of function in C programming.

Built-in Function

User-Defined Function

### 3. Give the syntax of function prototype.

```
returnType functionName(type1 argument1, type2 argument2, ...);
```

### 4. Give the syntax of calling function.

```
functionName(argument1, argument2, ...);
```

### 5. Write a syntax for Function with arguments and return value

Function declaration : `int function ( int );`

Function call : `function( x );`

Function definition:

```
int function( int x )
```

```
{
```

```
    statements;
```

```
    return x;
```

```
}
```

### 6. What is static function?

They can directly refer to other static members of the class. Static member functions do not have this pointer. Static member function can not be virtual.

### 7. What is recursion?

Recursion is a common method of simplifying a problem into subproblems of same type.

This is called divide and conquer technique. A basic example of recursion is factorial function.

### 8. Difference between `strcmp()` and `strncmp()`?

`strcmp` compares both the strings till null-character of either string comes whereas `strncmp` compares at most `num` characters of both strings. But if `num` is equal to the length of either string than `strncmp` behaves similar to `strcmp`

### 9. Difference between the formal argument and the actual argument.

The major difference between actual and formal arguments is that actual arguments are the source

of information; calling programs pass actual arguments to called functions. The called functions access the information using corresponding formal arguments. The following piece of code demonstrates actual and formal arguments.

**10. Write a Syntax of return statement.**

```
return (expression);
```

**11. How arguments are passed to functions in C?**

The call by reference method of passing arguments to a function copies the address of an argument into the formal parameter. Inside the function, the address is used to access the actual argument used in the call. It means the changes made to the parameter affect the passed argument.

**12. What is main() function?**

In C, the "main" function is treated the same as every function, it has a return type (and in some cases accepts inputs via parameters). The only difference is that the main function is "called" by the operating system when the user runs the program.

**13. What is pre-defined function?**

Any of a set of subroutines that perform standard mathematical functions included in a programming language; either included in a program at compilation time, or called when a program is executed.

## Unit V

### **1.What is Structure? Write the syntax for structure.**

Structures (also called struct) are **a way to group several related variables into one place**. Each variable in the structure is known as a member of the structure. Unlike an array, a structure can contain many different data types (int, float, char, etc.).

Syntax :

```
struct struct-name
{
    data_type var-name;
    data_type var-name;
    ...
};
```

### **2.How the members of structure object is accessed?**

Array elements are accessed using the Subscript variable, Similarly Structure members are accessed **using dot [.] operator**.

**Syntax:**

```
struct_var.member_name
stud1.roll_no
```

### **3. Define Nested Structure.**

A structure can be placed within another structure. That is, a structure may contain another structure as its member. Such a structure that contains another structure as its member is called a nested structure.

### **4. How typedef is used in structure?**

The C language contains the typedef keyword **to allow users to provide alternative names for the primitive (e.g., int) and user-defined (e.g struct) data types**.

Remember, this keyword adds a new name for some existing data type but does not create a new type.

### **5. What is meant by Self-referential structures?**

**A structure can have members which point to a structure variable of the same type.**

These types of structures are called self referential structures and are widely used in dynamic data structures like trees, linked list, etc.

### **6. List the use of typedef.**

Type def is a reserved keyword in the programming languages C and C++.

It is used **to create an additional name (alias) for another data type**, but does not create a new type, except in the obscure case of a qualified typedef of an array type where the typedef qualifiers are transferred to the array element type.

### **7. Differentiate between Structure and Array.**

Array refers to a collection consisting of elements of homogeneous data type. Structure refers to a collection consisting of elements of heterogeneous data type.

### **8. Define the meaning of Array structure.**

An array of structures is simply an array in which each element is a structure of the same type. The referencing and subscripting of these arrays (also called structure arrays) follow the same rules as simple arrays.