1. What is a pointer on pointer?

   It's a pointer variable which can hold the address of another pointer variable. It de-refers twice to point to the data held by the designated pointer variable.

2. Distinguish between malloc() & calloc() memory allocation.

   Both allocates memory from heap area/dynamic memory. By default calloc fills the allocated memory with 0's.

3. What is keyword auto for?

   By default every local variable of the function is automatic (auto). In the below function both the variables 'i' and 'j' are automatic variables.

```
void f() {
  int i;
  auto int j;
}
```

4. Explain the syntax for for loop.

```
for(initialization;condition;inc/dec) {
  //set of statements
}
```

5. What is a static variable?

   A static local variables retains its value between the function call and the default value is 0.

6. What is a NULL pointer?

   A pointer pointing to nothing is called so. Eg: char *p=NULL;

7. What is the purpose of extern storage specifier?

8. Explain the purpose of the function sprintf().
   Prints the formatted output onto the character array.

9. What is the meaning of base address of the array?
   The starting address of the array is called as the base address of the array.

10. When should we use the register storage specifier?
    If a variable is used most frequently then it should be declared using register storage specifier, then possibly the compiler gives CPU register for its storage to speed up the look up of the variable.

11. S++ or S = S+1, which can be recommended to increment the value by 1 and why?
    S++, as it is single machine instruction (INC) internally.

12. What is a dangling pointer?
    A pointer initially holding valid address, but later the held address is released or freed. Then such a pointer is called as dangling pointer.
13. What is the purpose of the keyword typedef?
    It is used to alias the existing type. Also used to simplify the complex declaration of the type
14. What is lvalue and rvalue?
    The expression appearing on right side of the assignment operator is called as rvalue. Rvalue is assigned to lvalue, which appears on left side of the assignment operator. The lvalue should designate to a variable not a constant.
15. What is the difference between actual and formal parameters?
    The parameters sent to the function at calling end are called as actual parameters while at the receiving of the function definition called as formal parameters.

16. Can a program be compiled without main() function?

Yes, it can be but cannot be executed, as the execution requires main() function definition.

17. What is the advantage of declaring void pointers?

Address of any variable of any data type (char, int, float etc.)can be assigned to a **void pointer** variable

18. What is a nested structure?

A structure containing an element of another structure as its member is referred so

19. What is the difference between variable declaration and variable definition?

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

20. What is a self-referential structure?

A structure containing the same structure pointer variable as its element is called as self-referential structure.

21. What is a token?

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

22. What is a preprocessor?

Preprocessor is a directive to the compiler to perform certain things before the actual compilation process begins.

23. What are command line arguments?

The arguments which we pass to the main() function while executing the program are called as command line arguments. The parameters are always strings held in the second argument (below in args) of the function which is array of character pointers. First argument represents the count of arguments (below in count) and updated automatically by operating system.

24. What are the different ways of passing parameters to the functions? Which to use when?

Call by value − We send only values to the function as parameters. We choose this if we do not want the actual parameters to be modified with formal parameters but just used.

Call by reference − We send address of the actual parameters instead of values. We choose this if we do want the actual parameters to be modified with formal parameters.

25. Describe the file opening mode “w+”.

Opens a file both for reading and writing. If a file is not existing it creates one, else if the file is existing it will be over written.

26. Where the address of operator (&) cannot be used?

It cannot be used on constants.

It cannot be used on variable which are declared using register storage class.

27. How many operators are there under the category of ternary operators?

There is only one operator and is conditional operator (? :).

28. Which key word is used to perform unconditional branching?

goto

29. Explain the use of comma operator (,).

Comma operator can be used to separate two or more expressions.

30. Which built-in library function can be used to re-size the allocated dynamic memory?

realloc()

31. Define an array.

Array is collection of similar data items under a common name.

32. What are enumerations?

Enumerations are list of integer constants with name. Enumerators are defined with the keyword enum.

33. Which built-in function can be used to move the file pointer internally?

fseek()

34. What is a variable?

A variable is the name storage.

35. Who designed C programming language?

Dennis M Ritchie.

36. C is successor of which programming language?

B

37. What is the full form of ANSI?

American National Standards Institute.

38. What is the full form of ASCII

39. Which operator can be used to determine the size of a data type or variable?

sizeof

41. What is an infinite loop?

A loop executing repeatedly as the loop-expression always evaluates to true such as

42. What is the default value of local and global variables?

Local variables get garbage value and global variables get a value 0 by default.

43. Explain about ‘stdin’.

stdin in a pointer variable which is by default opened for standard input device.

44. Define a structure.

A structure can be defined of collection of heterogeneous data items.

45. What is typecasting?

Typecasting is a way to convert a variable/constant from one type to another type.

46. What is recursion?

Function calling itself is called as recursion.

47. What is the output file generated by the linker.

Linker generates the executable file.

48. Can a function return multiple values to the caller using return reserved word?

No, only one value can be returned to the caller.

49. What is a constant?

A value which cannot be modified is called so. Such variables are qualified with the keyword const.

50. Apart from Dennis Ritchie who the other person who contributed in design of C language.

Brain Kernighan

What are different storage class specifiers in C?

Ans: auto, register, static, extern

What is scope of a variable? How are variables scoped in C?

Ans: Scope of a variable is the part of the program where the variable may directly be accessible. In C, all identifiers are lexically (or statically) scoped.

When should we use pointers in a C program?

1. To get address of a variable

2. For achieving pass by reference in C: Pointers allow different functions to share and modify their local variables.

3. To pass large structures so that complete copy of the structure can be avoided.

C

4. To implement “linked” data structures like linked lists and binary trees..

What is difference between i++ and ++i?

1) The expression ‘i++’ returns the old value and then increments i. The expression ++i increments the value and returns new value.

2) Precedence of postfix ++ is higher than that of prefix ++.

3) Associativity of postfix ++ is left to right and associativity of prefix ++ is right to left.

4) In C++, ++i can be used as l-value, but i++ cannot be. In C, they both cannot be used as l-value.

What are the key features in C programming language?

- **Portability** – Platform independent language.
- **Modularity** – Possibility to break down large programs into small modules.
- **Flexibility** – The possibility to a programmer to control the language.
- **Speed** – C comes with support for system programming and hence it is compiling and executes with high speed when comparing with other high-level languages.
- **Extensibility** – Possibility to add new features by the programmer.

What are the basic data types associated with C?

- **Int –** Represent number (integer)
- **Float –** Number with a fraction part.
- **Double –** Double-precision floating point value
- **Char –** Single character
- **Void –** Special purpose type without any value.

What is the description for syntax errors?

- **Ans)** The mistakes when creating a program called syntax errors. Misspelled commands or incorrect case commands, an incorrect number of parameters when called a method /function, data type mismatches can identify as common examples for syntax errors.

What is the process to create increment and decrement stamen in C?

- **Ans) There are two possible methods to perform this task.**
- **1)** Use increment (++) and decrement (-) operator.

Describe static function with its usage?

- **Ans)** A function, which has a function definition prefixed with a static keyword is defined as a static function. The static function should call within the same source code.

What is the difference between abs() and fabs() functions?

- **Ans)** Both functions are to retrieve absolute value. abs() is for integer values and fabs() is for floating type numbers. Prototype for abs() is under the library file < stdlib.h > and fabs() is under < math.h >.

Describe Wild Pointers in C?

- **Ans)** Uninitialized pointers in the C code are known as **Wild Pointers**.

Describe the difference between = and == symbols in C programming?

Ans) '==' is the comparison operator which is use to compare the value or expression on the left-hand side with the value or expression on the right-hand side.
'=' is the assignment operator which is use to assign the value of the right-hand side to the variable on the left-hand side.

What is the explanation for prototype function in C?

Prototype function is a declaration of a function with the following information to the compiler.

- Name of the function.
- The return type of the function.
- Parameters list of the function.

Describe the header file and its usage in C programming?

Ans) The file contains the definitions and prototypes of the functions being used in the program are called a header file. It is also known as a library file.

What is a nested loop?
Ans) A loop running within another loop is referred as a **nested loop**. The first loop is called Outer loop and inside the loop is called Inner loop. Inner loop executes the number of times define an outer loop.
What is a pointer on a pointer in C programming language?
Ans) A pointer variable that contains the address of another pointer variable is called pointer on a pointer. This concept de-refers twice to point to the data held by a pointer variable.

What is the behavioral difference when include header file in double quotes (“”) and angular braces (<>)?
Ans) When Header file include within double quotes (“”), compiler search first in the working directory for the particular header file. If not found then in the built in the include path. But when Header file include within angular braces (<>), the compiler only search in the working directory for the particular header file.

What is a sequential access file?
Ans) In general programs store data into files and retrieve existing data from files. With the sequential access file such data saved in a sequential pattern. When retrieving data from such files each data need to read one by one until required information find.

What are the modifiers available in C programming language?
Ans) There are 5 modifiers available in C programming language as follows.

- Short
- Long
- Signed

- Unsigned
- long long

What is C language

Why is C known as a mother language?

C is known as a mother language because most of the compilers and JVMs are written in C language. Most of the languages which are developed after C language has borrowed heavily from it like C++, Python, Rust, javascript, etc. It introduces new core concepts like arrays, functions, file handling which are used in these languages.

When was C language developed?

C language was developed in 1972 at bell laboratories of AT&T

What is the use of printf() and scanf() functions?

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.

What is the usage of the pointer in C?

- **Accessing array elements**: Pointers are used in traversing through an array of integers and strings. The string is an array of characters which is terminated by a null character '\0'.

- **Dynamic memory allocation**: Pointers are used in allocation and deallocation of memory during the execution of a program.
- **Call by Reference**: The pointers are used to pass a reference of a variable to other function.
- **Data Structures like a tree, graph, linked list, etc.**: The pointers are used to construct different data structures like tree, graph, linked list, etc.

What is dangling pointer in C?

- If a pointer is pointing any memory location, but meanwhile another pointer deletes the memory occupied by the first pointer while the first pointer still points to that memory location, the first pointer will be known as a dangling pointer. This problem is known as a dangling pointer problem.
- Dangling pointer arises when an object is deleted without modifying the value of the pointer. The pointer points to the deallocated memory.

What is a union?

- The union is a user-defined data type that allows storing multiple types of data in a single unit. However, it doesn't occupy the sum of the memory of all members. It holds the memory of the largest member only.
- In union, we can access only one variable at a time as it allocates one common space for all the members of a union.

What is the purpose of sprintf() function?

The sprintf() stands for "string print." The sprintf() function does not print the output on the console screen. It transfers the data to the buffer. It returns the total number of characters present in the string.

Can we compile a program without main() function?

Yes, we can compile, but it can't be executed.

What is the difference between getch() and getche()?

The **getch()** function reads a single character from the keyboard. It doesn't use any buffer, so entered data will not be displayed on the output screen.

The **getche()** function reads a single character from the keyword, but data is displayed on the output screen. Press Alt+f5 to see the entered character.

Use of fflush(stdin) in C

fflush() is typically used for output stream only. Its purpose is to clear (or flush) the output buffer and move the buffered data to console (in case of stdout) or disk (in case of file output stream).