1. What is c language?

The c language is a general-purpose, procedural computer programming language developed in the early 1970s by Dennis Ritchie at Bell Labs.

Key characteristics

- Mid-level Language: It contains features of both, low-level (like assembly, allowing memory manipulation) and high-level languages (providing structures and portability).
- Procedural: Programs are organized into functions (procedures) that contain sequences of statements to be executed.
- Portability: C compilers are available for almost every computer architecture, making code written in c highly portable.
- Memory Management: It allows for direct memory manipulation using pointers, which gives programmers fine-grained control but also requires careful handing.
- Foundation: Many modern languages (like C++, Java, Python) and Operating System (like Linux and parts of Windows) are either written in C or heavily influenced by its syntax and concepts.

2. What are the applications of c programming?

Ans: The c language is fundational in Software development, primarily due to its efficiency, speed, and capability for low-level hardware interaction.

1. Operating Systems (OS)
- Core Development: Used to write the kernel, the heart of the OS (e.g., Linux, UNIX).
- Reason: Provides direct memory access and generates highly efficient machine code.

2. Embedded Systems & IOT
- Hardware Control: Ideal for resource-constrained devices (small memory/CPU) like microcontrollers, traffic lights, Smart home applications, and Cameras.

- Reason: Small memory footprint and fast execution speed are essential

3. System Programming & Utilities
- Device Drivers: Used to create software interfaces for hardware devices (e.g., printers, graphics cards).
- Utility Tools: Building essential system commands and utilities (e.g., ls, grep in Unix)

4. Compilers and Interpreters
- Language Tools: The underlying code for many compilers (e.g., GCC) and the core interpreters for languages like Python (CPython) are written in C
- Reason: C's speed is leveraged to translate and execute other programming languages quickly

3. What is variable?

Ans. A variable in Computer programming is a named storage location in the Computer's memory (RAM) that holds a value. The value stored in this location can change during the execution of a program, which is why it is called "variable".

4. What are different data types in C programming.

Ans The primary fundamental data types in C programming are:
- int: For integers (whole numbers).
- char: for a single character or small integers.
- float: For single-precision floating-point numbers (numbers with a decimal point).
- double: For double-precision floating-point numbers (more precise than float).
- void: Used for specifying a function that returns no value or for generic pointers.

These can be modified using type qualifiers like short, long, signed and unsigned to create variations such as short int, long double, unsigned char etc

5. What is format Specifier?

Ans: A format specifier is a placeholder used in input/output functions in C-like programming languages (such as C, C++, and others) to tell the compiler what type of data for output. They are typically preceded by a percent sign. (%)

Specifier	Data Type it handles	Description
%d or %i	int	signed decimal integer.
%f	float or double	Decimal floating number
%c	char	single character
%s	char*	string (array of character).
%lf	double	Used for reading (scanf) a double (but %f is used for printing a double in printf).
%u	unsigned int	Unsigned decimal integer.
%p	Pointer	memory address (pointer).