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**Department: Computer Science**

**Course Code: COM 316**

**Course Title: C-Programming**

**Question One: Write a short note on the evolution of .Net Framework and C# in (100 words)**

.NET Framework is a software development framework developed by Microsoft that supports many languages like C#, Visual Basic, F#, etc. It includes a large class library called Framework Class Library and an environment called Common Language Runtime[**1**](https://www.c-sharpcorner.com/article/net-framework-evolution/). C# is a multi-paradigm programming language designed by Anders Hejlsberg. It is based on C++ and Java, but has many additional features like generics, delegates, LINQ, etc. The first version of C# was released in 2002 with .NET Framework 1.0. The latest version of C# is 11.0, released in 2022, which introduces features like raw string literals, generic math, and list patterns.

**Question Two: Explain the following terms: Mono, Xamarin, COM, .Net Core, Unity C# and REST**

These are some of the terms related to programming and web development. Here is a brief explanation of each term:

* **Mono:** Mono is an open source implementation of the .NET Framework that supports multiple platforms, such as Linux, macOS, Windows, Android, and iOS. Mono allows developers to use C# and other .NET languages to create cross-platform applications.
* **Xamarin:** Xamarin is a tool for building native mobile apps for Android, iOS, and Windows using C# and .NET. Xamarin enables code sharing across platforms, while also providing access to native features and performance. Xamarin is now part of .NET and integrated with Visual Studio.
* **COM:** COM stands for Component Object Model, which is a binary interface standard for software components. COM allows different components to communicate and interoperate, regardless of the programming language or platform they are written in. COM is widely used in Windows applications, such as ActiveX controls, OLE, and DirectX.
* **.NET Core:** .NET Core is a modern, cross-platform, and open source version of .NET that supports web, cloud, desktop, and mobile development. .NET Core is optimized for performance, scalability, and modularity. .NET Core includes the .NET Runtime, the .NET SDK, and ASP.NET Core.
* **Unity C#:** Unity C# is the scripting language used in Unity, which is a popular game engine and development platform for creating 2D and 3D games and applications. Unity C# is based on C#, but also provides access to the Unity API and features, such as GameObjects, Components, Physics, and Graphics.
* **REST**: REST stands for REpresentational State Transfer, which is an architectural style for designing web services and APIs. REST uses HTTP methods (such as GET, POST, PUT, and DELETE) and URIs (Uniform Resource Identifiers) to identify and manipulate resources on a server. REST also follows some principles, such as statelessness, uniform interface, and hypermedia.

**Question Three: Critically, explain ANY three key functions of CLR in 50 words**

The CLR is the execution environment for .NET code. Three key functions of CLR are:

* **JIT compilation**: It converts the common intermediate language (CIL) to machine code before execution.
* **Memory management**: It allocates and releases memory for managed objects using the garbage collector.
* **Type safety**: It ensures that the code only accesses the memory locations it is authorized to access.