**NAME:** OYEBODE JOHN TEMILOLUWA

**COURSE CODE:** COM 316 (C-PROGRAMMING)

**C# ASSIGNMENT ONE**

1. Write a short note on the evolution of Net Framework and C# **(100 words)**

2. Explain the following terms; Mono, Xamarin, COM, Net Core, Unity C#, REST

3. Critically, explain ANY three key functions of CLR **(50 words)**

**ANSWERS:**

1. The .NET Framework and C# have evolved significantly since their inception. Introduced by Microsoft in early 2000s, .NET Framework provided a robust platform for developing Windows applications. Over time, it expanded to support cross-platform development with .NET Core. The evolution culminated in the introduction of .NET 5, unifying .NET Core and Framework. Likewise, C# has matured from its initial version in 2000, incorporating features like LINQ, async/await, and pattern matching. The synergy of .NET and C# continues to drive modern, efficient, and cross-platform application development, emphasizing adaptability and performance in the ever-evolving tech landscape.

2 i. **Mono:** Mono is an open-source implementation of the .NET framework, allowing cross-platform development. It enables running .NET applications on various operating systems like Linux, macOS, and Windows.

ii. **Xamarin:** Xamarin is a framework within the Mono project that facilitates cross-platform app development using C#. It allows developers to create native applications for iOS, Android, and Windows with a shared codebase, enhancing code reusability.

iii. **COM (Component Object Model):** COM is a Microsoft technology for building modular, reusable software components. It defines how objects can interact, providing a standard interface for communication between different software components on the Windows platform.

iv. **.NET Core:** .NET Core is an open-source, cross-platform version of the .NET framework. It allows developers to build and run applications on Windows, Linux, and macOS. .NET Core offers improved performance, modularity, and support for modern development practices.

v. **Unity:** Unity is a popular game development engine. While not directly related to C#, Unity uses C# as its primary scripting language. It provides a robust framework for creating 2D and 3D games, simulations, and other interactive experiences.

vi. **C#:** (C Sharp) is a versatile, object-oriented programming language developed by Microsoft. It is widely used in various applications, including web development (ASP.NET), desktop applications, and game development (Unity). C# is known for its simplicity, type safety, and modern language features.

vii. **REST (Representational State Transfer):** REST is an architectural style for designing networked applications. It uses a stateless client-server communication model, typically over HTTP.

RESTful services use standard operations (GET, POST, PUT, DELETE) to manipulate resources. It is commonly employed in web services to enable communication between different software systems on the internet.

3 i. **Memory Management:**

CLR manages memory by handling memory allocation and deallocation, ensuring efficient use of resources. It includes a garbage collector that automatically identifies and collects unused objects, preventing memory leaks and enhancing application stability.

ii. **Just-In-Time Compilation (JIT):**

CLR converts Intermediate Language (IL) code into native machine code at runtime through JIT compilation. This optimizes performance by translating code into executable instructions specific to the underlying hardware.

iii. **Exception Handling:**

CLR provides a robust exception-handling mechanism, aiding in the detection and management of runtime errors. It ensures structured error handling, improving application reliability and maintainability.