**Introduction of .NET ( Assignment )**

**Ques 1: What is the main component in the .Net Framework?**

**Ans:** Main components of .NET framework are:

1. CLR(common language runtime) - CLR is the basic and Virtual Machine component of the .NET Framework. It is the run-time environment in the .NET Framework that runs the codes and helps in making the development process easier by providing the various services such as remoting, thread management, type-safety, memory management, robustness.

CLR provides interoperability between different language, like C# , VB, Visual C++, by providing a common environment for the execution of code written in these languages.

1. CTS(common type system) - CTS is a standard that specifies how type definitions and specific values of types are represented in computer memory.
2. CLS(common language specification) - Itis a part of the specifications of the .NET Framework. CLS defines a subset of Common Type System (CTS) . CTS and CLS ensures language interoperability.
3. Base class library - It provides the library classes and methods in C# ans VB.NET which is common for the languages in .NET

The following are different types of applications use of .net class library.

1. Windows Application.

2. Console Application

3. Web Application.

4. XML Web Services.

5. Windows Services.

**Ques 2: Current .Net Standard framework and Current core framework?**

Ans: .NET standard framework - 4.8

Core Framework-3.1

**Ques 3: Difference between Managed and Unmanaged code?**

**Ans: Managed Code:** It is executed by a managed runtime environment or managed by the CLR. Memory Buffer overflow does not occur.It provides runtime services like Garbage Collection, exception handling, etc. It provides security to the application written in .NET Framework.

**Unmanaged Code:** It is executed directly by the operating system. It does not provide any security to the application.Memory buffer overflow may occur. It does not provide runtime services like Garbage Collection, exception handling, etc. The source code directly compiles into native language.

**Ques 4: What do you mean by MSIL Code?**

**Ans:** MSIL is the Microsoft intermediate language. During the compile time , the compiler converts the source code into Microsoft Intermediate Language (MSIL) Microsoft Intermediate Language (MSIL) is a CPU-independent set of instructions that can be efficiently converted to the native code. It is used to convert the programming code into machine code. The .NET Compiler will create MSIL while you run your program and JIT(Just In Time compiler) will convert your MSIL to machine code.

**Ques 5: What is the difference between .Net and .Net Core Frameworks?**

**Ans :**  **.NET FRAMEWORK :** .NET framework is a software framework developed by Microsoft which includes a runtime environment for creating Windows apps and web services. It covers a large class library called.NET framework class Library; which is a combination of classes, interfaces, and value types that provide access to system functionality.

.Net framework provides a runtime software environment executes in a common language runtime(CLR) which is an application virtual machine that makes the development process easier. The services included in CLR are memory management, security and exception handling.

**.NET CORE:** .NET Core is the new cross-platform and open-source .NET framework to develop applications for all major operating systems including Mac, Linux, and Windows. .NET Core supports UWP and ASP.NET Core only. ASP.NET Core is used to build browser-based web applications and currently, it does not support a desktop application with the user interface. Programmers can develop applications and libraries in C#, VB.NET, and F# in both runtimes.

**Ques 6: Explain the execution process of managed code in .Net?**

Ans: Managed execution process include following steps:

1. Choosing a compiler

.Net Framework is a multi language execution environment, the runtime supports a wide variety of data types and language features. To obtain the full benefits provided by the common language runtime , use one or more language (VB.Net, C# etc.) compilers that target the runtime.

1. Compiling the code in MSIL

the execution style of compiling source code into machine level code, .Net language compilers translates the source code into Microsoft Intermediate Language. This ensures language interoperability because no matter which language has been used to develop the application, it always gets translated to Microsoft Intermediate Language. During the compile time the compiler produces metadata, that contains description of the program like dependencies, versions

1. Compiling MSIL to native code

Just In Time compiler (JIT) compiles the MSIL into native code and stores it in a memory buffer. During JIT compilation, the code is also checked for type safety.

1. Execution of code

After translating the IL into native code, it is sent to .Net runtime manager. The .Net runtime manager executes the code. During execution, managed code receives services such as garbage collection, security, interoperability with unmanaged code, cross-language debugging support, and enhanced deployment and versioning support.