

AMIETE – CS (New Scheme)

Time: 3 Hours

June 2019

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

- a. Which of the following statements is correct about Managed Code?
- (A) Managed code is the code that is compiled by the JIT compilers.
(B) Managed code is the code where resources are Garbage Collected.
(C) Managed code is the code that runs on top of Windows.
(D) Managed code is the code that is written to target the services of the CLR.
- b. Which of the following statements are correct about static functions?
1. Static functions can access only static data.
 2. Static functions cannot call instance functions.
 3. It is necessary to initialize static data.
 4. Instance functions can call static functions and access static data.
 5. this reference is passed to static functions.
- (A) 1, 2, 4 (B) 2, 3, 5
(C) 3, 4 (D) None of these
- c. What will be the output of the following code snippet when it is executed?
- ```
int x = 1;
float y = 1.1f;
short z = 1;
Console.WriteLine((float) x + y * z - (x += (short) y));
```
- (A) 0.1 (B) 1.0  
(C) 1.1 (D) 11
- d. How many times can a constructor be called during lifetime of the object?
- (A) As many times as we call it.  
(B) Only once.  
(C) Depends upon a Project Setting made in Visual Studio.NET.  
(D) Any number of times before the object gets garbage collected.

- e. What will be the output of the C#.NET code snippet given below?
- ```
int i = 2, j = i;  
if (Convert.ToBoolean((i / j & 5) & (j - 25 * 1)))  
    Console.WriteLine(1);  
else  
    Console.WriteLine(0);
```
- (A) 0 (B) 1
(C) Compile Error (D) Run time Error
- f. How can you prevent inheritance from a class in C#.NET ?
- (A) Declare the class as shadows.
(B) Declare the class as overloads.
(C) Declare the class as sealed.
(D) Declare the class as suppress.
- g. Which of the following statement is correct?
- (A) There is one garbage collector per program running in memory.
(B) There is one common garbage collector for all programs.
(C) An object is destroyed by the garbage collector when only one reference refers to it.
(D) We have to specifically run the garbage collector after executing Visual Studio.NET.
- h. A class implements two interfaces each containing three methods. The class contains no instance data. Which of the following correctly indicate the size of the object created from this class?
- (A) 12 bytes (B) 24 bytes
(C) 0 byte (D) 8 bytes
- i. Which among the given classes is present in System.Collection.Generic namespace?
- (A) Stack (B) Tree
(C) Sorted Array (D) All of these
- j. Suppose a Generic class called as SortObjects is to be made capable of sorting objects of any type(integer, single, byte etc). Then, which of the following programming constructs is able to implement the comparison function?
- (A) interface (B) encapsulation
(C) delegate (D) attribute

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

- Q.2** Summarize the .NET-centric building blocks, such as
- a. Common Language Runtime (CLR), Common Type System (CTS) (8)
- b. Common Language Specification (CLS), and base class libraries. (8)

- Q.3** Examine two C# features called *arguments* and *optional parameters*. How to create and manipulate arrays of data, define nullable data types (with the ? and ?? operators), and Mention the distinction between value types (including enumerations and custom structures) and reference types. (16)
- Q.4** How to define class properties, and come to understand the role of static members, object initialization syntax and read-only fields? How to build robust class types using constructors, properties, static members and constants? (16)
- Q.5** How to handle runtime anomalies in your code base through the use of structured exception handling. Write about the C# keywords that allow you to handle such problems (try, catch, throw, and finally), interpret the distinction between application-level and system-level exceptions. (16)
- Q.6** Write the code to interact with the garbage collector using the System.GC class type. Examine how the virtual System.Object.Finalize() method and IDisposable interface can be used to build types that release internal unmanaged resources in a timely manner. (16)
- Q.7** Write a C# code using custom interfaces, for bank accounts. Assume you are writing code that will ultimately allow computerized transfers between bank accounts, and assume for this example that there are many companies that may implement bank accounts, but they have all mutually agreed that any classes that represent bank accounts will implement an interface, IBankAccount, which exposes methods to deposit or withdraw money, and a property to return the balance. It is this interface that will allow outside code to recognize the various bank account classes implemented by different bank accounts. Although the aim is to allow the bank accounts to talk to each other to allow transfers of funds between accounts. (16)
- Q.8** Explore various generic types within the System.Collections.Generic namespace, how will you build your own generic methods and types (with and without constraints)? (16)
- Q.9** Explain the use of .NET delegates, Brief the C# event keyword, which can be used to simplify the manipulation of raw delegate programming. Investigate the role of the C# lambda operator (=>) and explore the connection between delegates, anonymous methods, and lambda expressions. (16)