DipIETE – CS (Current 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 is correct about variable naming conventions in C#?
   (A) It should not be a C# keyword.
   (B) It must not contain any embedded space or symbol such as ? - + ! @ # % ^ & * ( ) [ ] { }
   (C) Both **(A)** and **(B)**
   (D) None of these

b.   Which of the following is NOT an Assignment operator in C#.NET?
   (A) \=   **(B)** /=
   (C) *=   **(D)** +=

c.   Which one of the following statement is correct?
   (A) Array elements can be of integer type only.
   (B) The default value of numeric array elements is zero.
   (C) The length of an Array is the number of dimensions in the Array.
   (D) The rank of an Array is the total number of elements it can contain

d.   Select the class which is immutable
   (A) System.Text.StringBuilder   **(B)** System.String
   (C) System.StringBuilder   **(D)** System.Text.Builder

e.   Which of the following is the correct way to create an object of the class Sample?
   i. Sample s = new Sample();
   ii. Sample s;
   iii. Sample s; s = new Sample();
   iv. s = new Sample();
   (A) i, iii   **(B)** ii, iv
   (C) i, ii, iii   **(D)** iv, i

f.   Which of the following statement is correct about Interfaces used in C#.NET?
   (A) All interfaces are derived from an Object class.
   (B) Interfaces can be inherited.
   (C) All interfaces are derived from an Object interface.
   (D) Interfaces can contain only method declaration.

g. Which of the following statements is incorrect about delegate?
   (A) Delegates are reference types.
   (B) Delegates are object oriented.
   (C) Delegates are type-safe.
   (D) Only one method can be called using a delegate.

h. Select the type of exception which is NOT used in .Net.
   (A) NullReferenceException   **(B)** OutOfMemoryException
   (C) StackOverflowException   **(D)** StackUnderflowException

i. What is used as inheritance operator in C#?
   (A) Comma   **(B)** Dot
   (C) SemiColon   **(D)** Colon

j. What is sealed Modifier?
   (A) Prevents inheritance of a class   **(B)** Prevents method overloading
   (C) Prevents polymorphism   **(D)** Prevents illegal access to a class

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

Q.2 a. What is the primary motivation of Microsoft Corporation in developing C# language? What are the shortcomings of C++ language ? List atleast five. **(8)**

b. (i) Differentiate C++, Java and C#.
(ii) Write a C# program to read two strings from the keyboard using the ReadLine statements and display them on one line using two Write statements. **(8)**

Q.3 a. Write a short note on operators in C# with small examples. **(10)**

b. Write a C# program to add all the odd numbers from 0 to 20. Use a simple if and goto statements to form a loop of operations. **(6)**

Q.4 a. Explain all types of arrays with its declaration, creation and initialization with necessary C# syntaxes. **(8)**

b. Write a C# code to sort a list of given numbers. **(8)**

Q.5 a. Explain two types of strings mutable and immutable with its implementation mechanisms. **(8)**

b. How regular expressions are used for manipulating strings? **(8)**

Q.6   Design a class to represent a bank account. Include the following members:
Data members
   • Name of the depositor
   • Account number
   • Type of account
   • Balance amount in the account
Methods
   • To assign initial values
   • To deposit an amount

- To withdraw an amount after checking balance
- To display the name and balance

Write a program to demonstrate the working of the various class members.   **(8)**

b. Create a base class called Shape. Use this class to store two double type values that could be used to compute the area of figures

- Derive two specialized classes called Triangle and Rectangle from the base Shape.
- Add to the base class, a method Set to initialize base class data members and another method Area to compute and display the area of figures.
- Make Area as a virtual method and redefine this method suitable in the derived class.

Using these classes, design a program that will accept dimensions of a triangle or rectangle interactively and display the area.

Note: The two values given as input will be rated as length of two sides in the case of rectangles and as base and height in the case of triangles.   **(8)**

Q.7   Explain Briefly: **(8)**
(i) Defining an Interface
(ii) Extending an Interface
(iii) Implementing Interfaces
(iv) Explicit Interface Implementation,
(v) Abstract Class and Interfaces

b. Write a class called Date that includes data members day, month and year and methods that could implement the following tasks
(i) Read a date from keyboard
(ii) display a date
(iii) increment a date by one day
(iv) compare two dates to see which one is greater
use operator overloading where applicable.   **(8)**

Q.8   a. Write short notes on Delegates and Events   **(8)**

b. Write a code to display asterisk(star) symbol in triangle format as shown below.   **(8)**
```
     *
    * *
   * * *
  * * * *
 * * * * *
* * * * * *
```

Q.9   a. Write a program that will read a name from the keyboard and display it on the screen. The program should throw an exception when the length of the name is more than 15 characters. Design your own exception mechanism.   **(6)**

b. Write a C# program to generate divide by zero exception and also handle this exception.   **(4)**

c. How will you create, start and schedule a thread?   **(6)**