(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
FOURTH YEAR SEMESTER ONE EXAMINATIONS

FOR THE DEGREE OF
BACHELOR OF SCIENCE
(COMPUTER SCIENCE)

COURSE CODE : CSC 460E

COURSE TITLE : **PROGRAMMING WITH C# & .NET FRAMEWORK**

DATE: 16/11/22 **TIME: 08.00 A.M – 10.00 A.M**

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

a) Define the following terms. **[2 Marks]**

   i. Namespace

   ii. Encapsulation

b) C# has a way of handling data through data types. Giving reasons, explain why data types are very important in C#. **[4 Marks]**

c) Operators in C# have been classified into four groups. State these groups while giving examples of each. **[4 Marks]**

d) Write a C# program that prompts the user to enter a positive integer. The program should display all numbers that can divide the number entered. If the user enters **8**, then the output will be **1,2,4,8** **[4 Marks]**

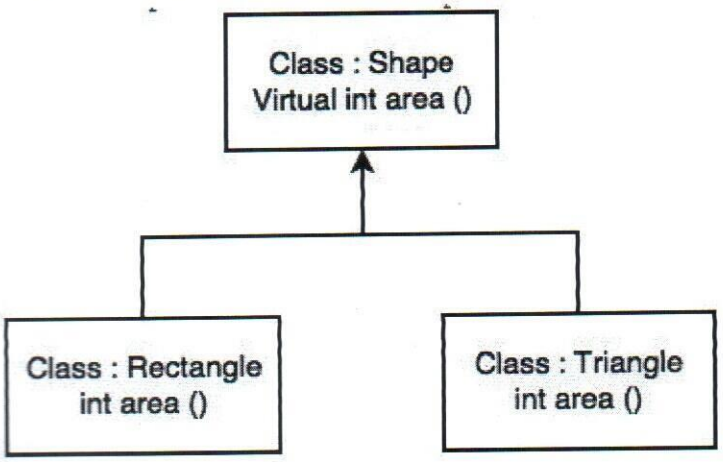
e) Write a C# program that prompts the user to enter a positive integer; the program should then display every fourth odd number greater than 0 and less than the number entered. The output might look like: **[6 Marks]**

Enter Positive Integer: 20

The output: 7,15

f) Write a C# program that uses a function to calculate the GCD of two numbers passed as arguments. **[4 Marks]**

g) Write a C# program that uses necessary data members to compute area of each shape while implementing inheritance shown. **[6 Marks]**



QUESTION TWO [20 MARKS]

a) Differentiate between the following terms **[4 Marks]**

   i. Identifier and Variable

   ii. Return and Break Statement

b) Any variable must be declared and initialized before being used. Explain using examples relevance of this to the compiler. **[4 Marks]**

c) Write a C# program that prompts the user for two integer values and swap them without using the third variable. **[4 Marks]**

d) Write a program in C# Sharp to copy the elements of one array into another array. The elements should then be displayed in reverse order. **[8 Marks]**

QUESTION THREE [20 MARKS]

a) Define the following terms **[2 Marks]**

   i. Class

   ii. Constructor

b) Discuss the importance of classes in C# programming. **[4 Marks]**

c) What will be the result of the following code? **[4 Marks]**

```
class P
{ }
class Q : P
{ }

class A
{
    public void abc(Q q)
    {
        Console.WriteLine("abc from A");
    }
}

class B : A
{
    public void abc(P p)
    {
        Console.WriteLine("abc from B");
    }
}

static void Main(string[] args)
{
    B b = new B();
    b.abc(new Q());
    Console.ReadLine();
}
```

d) Method overloading is taken to be one form of polymorphism. Explain using examples how this occurs. **[4 Marks]**

e) Consider the class below

```
public class Point
{
    public int X { get; set; }
    public int Y { get; set; }
    public Point(int xPos, int yPos)
    {
        X = xPos;
        Y = yPos;
    }
}
```

There are 3 instances of the class shown below. Will the following initialization of the third instance work? If it won't, what should be done? **[6 Marks]**

```
Point ptOne = new Point(15, 20);
Point ptTwo = new Point(40, 50);
Point ptThree = ptOne + ptTwo;
```

QUESTION FOUR [20 MARKS]

a) Define the following terms **[2 Marks]**

   i. Exception

   ii. Generic Types

b) Discuss four steps of handling exceptions in C#. **[4 Marks]**

c) Illustrate using examples the difference between an error and exception. **[4 Marks]**

d) Write a generic class that has two instant variables. The class should have two constructors, getters and setters. Write a driver program that will test the class defined. **[6 Marks]**

e) Using examples of your choice, explain how generic method is defined and used. **[4 Marks]**

QUESTION FIVE [20 MARKS]

a) Define the following terms **[2 Marks]**

   i. GUI

   ii. Events

b) GUI is said to be a common feature in modern systems. Explain how C# can be used to create a GUI. **[4 Marks]**

c) A good GUI requires good planning, explain the process of coming up with a good GUI. **[6 Marks]**

d) Events are powerful features of C#, explain the life cycle of event processing in C#. **[2 Marks]**

e) Write a C# program that simulates a clock with hour, minute and second hand. **[6 Marks]**