



**KENYATTA UNIVERSITY**  
**UNIVERSITY EXAMINATIONS 2011/2012**  
**FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF**  
**SCIENCE IN TELECOMMUNICATION AND INFORMATION TECHNOLOGY**

**SPH 409: COMPUTER PROGRAMMING**

DATE: Thursday, 1<sup>st</sup> December, 2011

TIME: 11.00 a.m. – 1.00 p.m.

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**INSTRUCTIONS:** Attempt question **ONE** and any other **TWO** questions.

**Q1** a. Windows programming involves the use of, and linkage of “controls” to “code”.

- i. Identify the parts of a windows program where controls and code are placed respectively. (2 Marks)
- ii. Using illustrations if possible, explain how the above statement is achieved in practice (6 Marks)
- iii. Identify controls that store and use lists of unspecified number of text items. (4 Marks)
- iv. Show how lists of texts with undefined number of items are defined in C# code.(6 Marks)
- v. Write a method that will respond to button action to display lists of text items in the code part iv. in the controls listed in part iii. (6 Marks)

b. Property blocks are used to move variables from into and out of objects in C#.

- i. Explain why property blocks are necessary in the first place. (3 Marks)
- ii. Using examples illustrate how property blocks are created and used. (3 Marks)

**Q2** Decisions and selection are key part of programming.

- i. The switch() command is one code that is used for selection. Explain and illustrate how the switch() works. (4 Marks)

Consider the following piece of code used to get and pass registration numbers for students in the Kenyatta University format.

```

private void RegistrationNumber()
{
    if(EducationRadioButton.Checked==true) RegNumber="E37";
    else if(ScienceRadioButton.Checked ==true) RegNumber="I20";
    else if(TITRadioButton.Checked ==true) RegNumber="I21";
    else if(IndChemRadioButton.Checked ==true) RegNumber="I74";
    else RegNumber="I71";

    if (SelfSponsoredCheckBox.Checked == true) RegNumber += "S/";
    else RegNumber += "/";

    RegNumber += MiddleNumberTextBox.Text;
    RegNumber += "/";

    RegNumber += Convert.ToString (YearUpDown.Value);
}

```

It is now proposed that the nested if loop shown in bold be replaced by a switch() command.

- ii. Convert the nested if loop to use a switch() instead. (8 Marks)
- iii. Propose a complete graphical user interface to implement pick the variables in the method from the user and display final result in a text box. (4 Marks)
- iv. Write code for two methods, one that will link the action to a control on the user interface and another to clear the buttons once the contents have been displayed. (4 Marks)

**Q3.** Inheritance is principle form of object re-use in C#.

- i. Explain the meaning of inheritance. (4 Marks)

Consider the listing below for an object to be used for storing data on countries.

```

class Country
{
    //Country attributes
    private string countryname;
    private string countryarea;
    private string countrypopulation;

    // Country object constructor with default names
    public Country (string name, string area, string population)
    {
        countryname = name;
        countryarea = area;
        countrypopulation = population;
    }
    // An empty Country object constructor
    public Country()
    {
    }
}

```

An improved application is to be developed that will need to display the information in this object in controls along with the country's flag.

- ii. Using the existing object, propose a new object for the new application. (4 Marks)
- iii. Sketch a possible user interface for the new application to include the flag. (6 Marks)
- iv. If the flags for countries are placed in a directory, E:\Flags\, write the method to load and display the flag on the control for selected country. (6 Marks)

**Q4 .** Consider the following graphical user interface for a database for student database using the Kenyatta University format.

- i. Propose names for the controls on the form. (4 Marks)
- ii. Based on your own knowledge of student details used in Kenyatta University and the buttons on the form, propose actions for buttons in the application. (4 Marks)
- iii. Propose a table format for the data on this database. (4 Marks)
- iv. Describe the data format in an Extensible Mark-up Language. (4 Marks)
- v. Write down the code for the table adapter that adds new data to the database (4 Marks)

**Q5.** The term primitives is used to describe a form of graphics in C#.

- a. Explain the meaning of the word primitive in this case. (4 Mark
- b. Describe the stages of creating “primitive” graphics in C#. (4 mark

The *onPaint* method is associated with all controls in C# and can be used to display all types of graphics.

- c. By writing a proper code, show how this method can be used to display any sketch and change its attributes dynamically using external controls. (12 Mar