



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

**A. M. E. C. E. A**

P.O. Box 62157

00200 Nairobi - KENYA

Telephone: 891601-6

**MAIN EXAMINATION**

**MAY – JULY 2019 TRIMESTER**

**FACULTY OF SCIENCE**

**DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE**

**SPECIAL . SUPPLEMENTARY EXAMINATION**

**CMT 307: . NET PROGRAMMING**

**Date: JULY 2019**

**Duration: 2 Hours**

1. **INSTRUCTIONS: Answer Question ONE and any other TWO Questions**
2. Questions **Q1c, 2b, Q4e& 5b** are practical questions and therefore should be done on **PC**.
3. Students **MUST** ensure all the work done on the PC has been successfully saved in their **folders** bearing **APPROPRIATE student registration** and submitted for marking at the end of the exam time

The format of naming the folder is “**CMT 307-registration number**” e.g. **CMT 307-1000001** if the student registration number is **1000001**

- Q1. a) Compare and contrast .NET and J2EE architectures from the following perspectives
- i. Tools support **(2 marks)**
  - ii. Execution engines **(2 marks)**
  - iii. Platform independence **(2 marks)**
- b) There are three major mechanisms employed by .NET architecture to support multiple programming languages. Discuss TWO of those mechanisms and how they help in supporting more than one programming languages **(4 marks)**

- c) You have been approached by an upcoming vehicle auction organization to create for them a windows phones application with two pages; search.xaml and NewVehicle.xaml.

The NewVehicle.xaml shall be used by admins to add new vehicle for the organization. Information to be captured includes the vehicle make e.g. Toyota, Nissan e.t.c, vehicle model e.g. premio, Camry e.t.c, body type e.g. hatchback, sedan, bus e.t.c, vehicle transmission type either automatic or manual, year of manufacture, price of the vehicle, engine capacity of the vehicle and a description of that vehicle. This information shall be stored by the app in appropriate variables in order to be used later by users to search for vehicle of interest by users

The page contains a customized application bar containing a save button. Upon clicking the button, two things shall happen

1. The application has to force the user to enter all the above information before
2. The application has to confirm if the price is a number and has a value of more than 800.

Once the two conditions have been met, then the user input shall be saved on appropriate variables, a successful confirmation message displayed for the user then the application redirects the user to the search.xaml file else appropriate error messages shall be displayed and save operation shall be aborted.

The search.xaml page should allow a user to search for a vehicle based on 8 parameters; vehicle make, vehicle model, body type, drive type, year of manufacture, price range (minimum and maximum) and engine capacity and category of the property. The page will also have its own customized application bar containing two buttons; new and search.

Once the new button is clicked, it should redirect the user to the NewVehicle.xaml page. When the search button is clicked, the application will perform two things

1. Check if the user has entered the above eight search parameters. If no, appropriate messages should be displayed and search operation aborted.
2. Check if the minimum, maximum price and year of manufacture are numbers and the values are more than zero. If no, appropriate messages should be displayed and search operation aborted.

Once the above two conditions are met, the eight search parameters shall be passed to a method known *FindVehicle()* which displays the Vehicle price and its description matching the eight criteria else display the appropriate unsuccessful message. **(17marks)**

- d) Discuss **TWO** techniques programmers using Visual Studio IDE can use to debug their programs **(3 marks)**

Q2.

- a) Explain any **TWO** iterative control structures supported by C#. For each control structure, give an example to demonstrate its usage **(3 marks)**
- b) Create a new windows phone project known as "Q2" which is used to allow a user to display an image on an image control. The image to be displayed shall be selected from the phone gallery **(6 marks)**
- c) Explain the role of the following Visual studio IDE components to windows phone programmers
- i). Tool box **(1 mark)**
  - ii). XAML view **(1 mark)**
  - iii). Phone emulator **(1 mark)**
- d) Discuss how .NET framework compiles .NET compliant source code into binary. Compare and contrast the same with Java compilation **(6 marks)**

e) Explain any **TWO** main reasons that motivated Microsoft corporation to develop .NET framework **(2 marks)**

Q3. a) Discuss how .NET framework compiles .NET compliant source code into binary. Compare and contrast the same with Java compilation **(6 marks)**

b) Discuss any **TWO** mechanism used by Windows phone application programmers so that they can store data in a more permanent way so that the data doesn't get lost when the phone reboots**(3 marks)**

c) A car taxi lending company usually bills their customer based on the number of kilometers spend after lending a given car. The old speedometer readings are recorded by the organization when the customer is issued with the car. The new speedometer readings are read and recorded when the customer returns the car. The difference between the two is usually used to determine the customer bill.

Create a new windows phone application which accepts the above two units which shall be passed to a method known as *CustomerBill* ( ) which calculates the bill of the customer based on the following rates

Distance in KM covered	Rate (in Ksh.)
0-100	130
Over 100	Ksh. 20 for any additional KM covered

The customer bill shall be taxed at a rate of 16%. The final bill shall be obtained by adding the tax to the customer bill. Output from the program should be the tax amount, customer bill and final bill

Type, debug, test and save the final program to the folder bearing your registration number **(11 marks)**

Q4.

a) After create a new windows phone application, three files are usually added

- by default. Explain the role of those file **(6 marks)**
- b) Explain two ways through which you can define the user interface for a windows phone application **(2 marks)**
- c) Discuss any **TWO** benefits associated with modular programming **(2marks)**
- d) Explain the reasoning behind the two stages of compilation in .NET framework **(4 marks)**
- e) Explain the major difference between the following as used in context of .NET programming
- i). between a stack panel and canvas control **(2 marks)**
  - ii). Managed code and Native code **(2 marks)**
- f) With valid examples, demonstrate the two types of type casting supported by C# **(2 marks)**

Q5.

- a) Discuss the role played by the **TWO** major components of the .NET framework **(4 marks)**
- b) While creating windows phone applications, discuss the two types of application you can create and what kind of functionality it offers to client **(4 marks)**
- c) Add a new windows phone project known as “Q5” which shall allow the user to display image on a image control. The user should first select whether to capture/browse for the image from the phone gallery. If they select to use a phone camera, the application should render an application bar with a camera button which upon be clicked, it should allow the user to capture image using phone emulator camera then display it on the image control

If the user decides to choose the option browse from the phone, the application should allow the user to select a photo from the phone gallery

then display it on the image control. By default, when the application starts, the application bar should not be visible to the user (12 marks)

**\*END\***