KIBABII UNIVERSITY COLLEGE

(A Constituent College of Masinde Muliro University of Science and Technology)

UNIVERSITY EXAMINATIONS
2013/2014 ACADEMIC YEAR

FOR THE CERTIFICATE IN INFORMATION TECHNOLOGY

COURSE CODE: **DIT 052 – Marking Scheme**
COURSE TITLE: RAPID APPLICATION PROGRAMMING
DATE: December, 2014   **TIME: 2 Hrs**

INSTRUCTIONS
ANSWER **QUESTION ONE** AND **ANY TWO** QUESTIONS

Q1.
   a) Define the following as used in programming:-
      i. Semantic - *This are the rules that govern programming languages in general*
      ii. Syntax - *This are rules that specifically govern certain programming languages*
                                                 (4 Marks)

b) Describe the Visual Basic programming toolbox controls, indicating their respective naming
convention styles.   (9 Marks)
     Pointer (Ptr) - *For pointing and selecting of various items and controls on the interface.*
     Picture box (Pic) - *For importing and including pictorial demonstrations in to the program.*
     Command button (cmd) - *A control that responds to an event but executing instructions*
     underneath
     Combo box (cbo) - *A hidden list control that only displays list once instructed to do so.*
     List Box (lst) - *A control that displays a list of items in a program.*
     Option button (opt) - *A control that enables the user only select one item from a list of*
given *items*
     Check Box (chk) - *A control that enables the user select several items from a list of given*
items
     Image box (img) - *A control for importing and including images in to the program*
     Data (dat) – *A control that enables visual basic interact with other database programs*

Describe the qualities of a good program.   (5 Marks)
    The interface should be simple to use i.e. less crowded and well labeled controls
    Should have a consistent interface design througout the system

Should be well validated
Should give discriptive and understandable error messages
Should be verifiably correct
Should be easily customisable to adapt to new technologies
Should be easily mantainable

Consider the following program:-

```
Private Sub Command1_Click()
        Dim x as single
        Dim y as single
        Dim y as single

        x = InputBox("Enter the value of x")
        y = InputBox("Enter the value of y")

        z= x + y

        MsgBox "The result is "&z

        End Sub
```

i)   Identify the errors in the above program and suggest corrections to the program.   (2 Marks)

> *y has been declared twice and z has not been declared but used in the program.*

ii)   If the errors were corrected and the program executed, discuss the program output. (4 Marks)

> *The program would give out a concatenated value of x and y. To give the summation of x and y   values, the two variables have to be converted to data types that enable summations such as integer, double, long, etc.*

Q2
Design an interface that would enable a user enter values in two text box controls and display the answer in a third text box control. Indicate the controls complete with their respective tentative names in tandem with the Visual Basic naming conventions   (6 Marks)

Write a program that calculates the Area of a Rectangle whose sides are defined by the user.

(3 Marks)

```
Private Sub Command1_Click()
        Dim x,y,Area as integer

        x = InputBox ("Enter the Length of the rectangle ")
        y = InputBox ("Enter the Width of the rectangle ")

        Area = x*y

        MsgBox "The Area is " & Area

End Sub
```

Write a program that calculates the volume of a cylinder whose dimensions are defined by the user.

(3 Marks)

```
Private Sub Command1_Click()
        Dim Radius, Area as double

        Const PI = 3.14

        Radius = InputBox ("Enter the radius of the circle ")

        Area = PI * Radius * Radius

        MsgBox "The Area of the circle is " & Area
```

End Sub

Using one function, implement a program that calculates the Area and Circumference of a circle whose dimensions are defined by the user   (6 Marks)

Private Sub Command1_Click ()
*   Dim Radius as Double*
*   Radius = InputBox("Enter the radius of the Circle ")*
*   Call AreaCircumference(Radius)*
End Sub

Function AreaCircumference(x As integer)
*   Dim Circumference as integer*
*   Const PI = 3.14*
*   Area = PI * x^2*
*   Circumference = PI * (2*x)*
*   MsgBox "The Area is " & Area*
*   MsgBox "The Circumference is " & Circumference*
End Function

NB. The the perimeter of a rectangle is given by 2(L+W), area of a circle is given by πr^2 while the volume of the cylinder is given by $\pi r^2 h$

Q3
Describe the System Development Cycle   (18 Marks)

Preliminary System Study

Preliminary system study is the first stage of system development life cycle. This is a brief investigation of the system under consideration and gives a clear picture of what actually the physical system is? In practice, the initial system study involves the preparation of a 'System Proposal' which lists the Problem Definition, Objectives of the Study, Terms of reference for Study, Constraints, Expected benefits of the new system, etc. in the light of the user requirements.

Feasibility Study

In case the system proposal is acceptable to the management, the next phase is to examine the feasibility of the system. The feasibility study is basically the test of the proposed system in the light of its workability, meeting user's requirements, effective use of resources and of course, the cost effectiveness. These are categorized as technical, operational, economic and schedule feasibility. The main goal of feasibility study is not to solve the problem but to achieve the scope. In the process of feasibility study, the cost and benefits are estimated with greater accuracy to find the Return on Investment (ROI). This also defines the resources needed to complete the detailed investigation. The result is a feasibility report submitted to the management.

Detailed System Study

The detailed investigation of the system is carried out in accordance with the objectives of the proposed system. This involves detailed study of various operations performed by a system and their relationships
within and outside the system. During this process, data are collected on the available files, decision points and transactions handled by the present system. Interviews, on-site observation and questionnaire are the tools used for detailed system study.

System Analysis

Systems analysis is a process of collecting factual data, understand the processes involved, identifying problems and recommending feasible suggestions for improving the system functioning. This involves studying the business processes, gathering operational data, understand the information flow, finding out bottlenecks and evolving solutions for overcoming the weaknesses of the system so as to achieve the organizational goals. System Analysis also includes subdividing of complex process involving the entire system, identification of data store and manual processes. The major objectives of systems analysis are to find answers for each business process.

System Design

Based on the user requirements and the detailed analysis of the existing system, the new system must be designed. This is the phase of system designing. It is the most crucial phase in the developments of a system. The logical system design arrived at as a result of systems analysis is converted into physical system design.

Coding

The system design needs to be implemented to make it a workable system. This demands the coding of design into computer understandable language, i.e., programming language. This is also called the programming phase in which the programmer converts the program specifications into computer instructions, which we refer to as programs. It is an important stage where the defined procedures are
transformed into control specifications by the help of a computer language. The programs coordinate the data movements and control the entire process in a system.

Testing

Before actually implementing the new system into operation, a test run of the system is done for removing the bugs, if any. It is an important phase of a successful system. After codifying the whole programs of the system, a test plan should be developed and run on a given set of test data. The output of the test run should match the expected results. Sometimes, system testing is considered a part of implementation process.

Implementation

After having the user acceptance of the new system developed, the implementation phase begins. Implementation is the stage of a project during which theory is turned into practice. The major steps involved in this phase are:

i. *Acquisition and Installation of Hardware and Software*
ii. *Conversion*
iii. *User Training*
iv. *Documentation*

The hardware and the relevant software required for running the system must be made fully operational before implementation. The conversion is also one of the most critical and expensive activities in the system development life cycle. The data from the old system needs to be converted to operate in the new format of the new system.

The database needs to be setup with security and recovery procedures fully defined.

Maintenance

Maintenance is necessary to eliminate errors in the system during its working life and to tune the system to any variations in its working environments. It has been seen that there are always some errors found in the systems that must be noted and corrected. It also means the review of the system from time to time. The review of the system is done for:

➢ *knowing the full capabilities of the system*
➢ *knowing the required changes or the additional requirements*
➢ *studying the performance.*

Q4.

a) Using the necessary examples, discuss the Visual Basic Programming control structures (9 Marks)

b) Using a control structure of your choice, implement a program that would define the following pattern.

```
*
* *
* * *
* * * *
* * * * *
*
* *
* * *
* * *
* * * *
* * * * *
```

(5 Marks)

Private Sub Command1_Click()
    Dim x, y as integer

    for x=1 to x=1 Step -1
        for y=5 to y>=x Step -1
            Select Case y

Case 1
    debug.print ""*
Case 2
    debug.print " *"*
Case 3
    debug.print " * *"*
Case 4
    debug.print " * * *"*
Case 5
    debug.print " * * * *"*
next y
next x
End Sub

c) Discuss the output of the following program

```
Private Sub Command1_Click()

    Dim m, n, p, q as integer

    n = 3
    m = 2

    p = m + n

    q = (p + m) * n

    MsgBox "The result is "&q

End Sub
```

(4 Marks)

This program gets the sum of m and n then assigns it to p. It then sums the value of p and m and multiplies it by the value of n and assigns it to q. It then displays the value of q.

Q5
Given the following information, in an upcoming health center, patient is required to first report at the registry where the patient details are taken. The patient is then send to the consultancy room where the consultant takes the patient's symptoms, makes a diagnosis then decided whether the patient goes to the Lab for tests or not. If he/she is send to the Lab, the patient is tested and send back to the consultant for more diagnosis and prescriptions. If not, the consultant prescribes medication then sends him/her to the pharmacy. From the pharmacy, the patient clears with the accounts before leaving.
    a) Draw a flowchart diagram to represent the flow of information in the program above.

(8 Marks)

b)   Briefly define the Tables and a description of the fields that are involved in developing the database of the above system   (10 Marks)