



MACHAKOS UNIVERSITY

University Examinations for 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR FIRST term EXAMINATION FOR

DIPLOMA OF INFORMATION COMMUNICATION TECHNOLOGY

CODE 2920/205: VISUAL PROGRAMMING

DATE: 27/3/2023

TIME: 2:30 – 5:30 PM

Instructions:

Answer any FIVE questions

Don't write on this question paper

QUESTION ONE

- a) Write a Visual Basic program that accepts a text through *a text box*. The program should then display the following *on a picture box*:
- Number of characters of the text;
 - First three characters of the text;
 - Extract three characters starting from second character.
- Attach the code to *a command button*. (6 marks)
- b) State the appropriate data type for a variable used to store each of the following in a visual basic program:
- The height of a student in cms;
 - The number of students in a class;
 - The academic grade of a student;
 - Country status, whether rich or poor. (4 marks)
- c) Write a visual basic program that would prompt a user to enter the dimensions in meters of a college's rectangular playing field through the use of textboxes, the program should then compute the area covered by the playing field in hectares and display it through a message box. Attach the code to a command click event. Hint: 1 hectare = 10000 square meters. (6 marks)
- d) With the aid of an example in each case, distinguish between string and *Boolean* data type in Visual Basic programs. (4 marks)

QUESTION TWO

- a) Explain each of the following components of a visual basic program:
- a. Method;
 - b. Event procedure;
 - c. Module.
- (6 marks)

- b) Distinguish between *implicit* and *explicit* declaration as used in a visual basic programming language.
- (4 marks)

- c) The surface area of a sphere is obtained using the formulae:

$$A=4\pi r^2$$

Where π is a mathematical constant 3.14 and r is its radius. Write a program in Visual Basic that accepts a radius from a textbox then computes the surface area. The program should then display the area on a picturebox control. Attach the code to a command button.

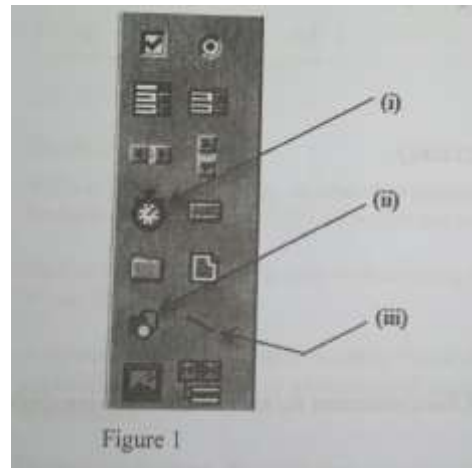
(6 marks)

- d) Distinguish between checkbox and option button as used in visual basic programs.
- (4 marks)

QUESTION THREE

- a) A software company opted to be using Visual Basic programming to develop applications. Explain **three** advantages of using this language to develop desktop applications.
- (6 marks)
- b) Describe the function of each of the following in an integrated Development environment in visual basic:
- a. Toolbox;
 - b. Properties Window;
 - c. Project window;
 - d. Code editor window.
- (8 marks)

- c) Figure 1 shows a section of a toolbox window in a visual basic program. Explain the function of the controls labeled i to iii. (6 marks)



QUESTION FOUR

- a) Explain why it is advisable to use a byte data type instead of an integer data type to store a value that is less than 100. (2 marks)
- b) A student preceded the caption of a command button with an ampersand (&) symbol. Outline the purpose of the ampersand. (2 marks)
- c) Figure 1 shows a visual Basic window at designed time. Use it to answer the questions that follow.

Form1	
Enter Registration No	045
Enter Name	Mike
Enter Hourly Rate	100
ADD	

Labels on the right side of the form:

- txtRegno (points to the Registration No text box)
- cboCountry (points to the Combo1 control)
- txtName (points to the Name text box)
- txtRate (points to the Rate text box)
- cmdDisplay (points to the ADD button)

Write Visual Basic programs attached to a command click that will;

- Change the font color and font style of the value 'Mike' to red and italic respectively (2marks)
- Clear all the texts in the text boxes. (2 marks)
- Add the following values to the combo box:
Kenya, Uganda, Tanzania, Sudan (3marks)

- iv. Change the font size and background color of the information in the combo box to 18 and green respectively. Use a *with statement*. (3 marks)
- d) With the aid of an example, distinguish between the *name property* and the *caption property* as used in a visual basic program. (4 marks)
- e) Explain giving a reason why it is important to set Autosize property of a picture box to true when designing programs in visual basic. (2 marks)

QUESTION FIVE

- a) State the property that could be used for the output in each of the following Visual basic controls.
- Textbox
 - Label
 - Picture box
 - Combo box (4 marks)
- b) The length of the hypotenuse of a right angled triangle is given by the formula $c = \sqrt{a^2 + b^2}$ where a and b are the perpendicular sides and c is the hypotenuse. Write a visual basic program that would accept the values of a and b through the use of text boxes, compute the hypotenuse and display the results on a message box. (6 marks)
- c) Distinguish between *user defined* and *system defined* constants as used in Visual Basic programming. (4 marks)
- d) The segment of code below is a declaration of a user defined data type in Visual Basic programming.

```
Private Type Customer
    CustomerName As String
    AccNo As Integer
    Balance As Currency
End Type
```

Write a segment code to declare a variable of Customer type. The program should then assign the values in the table below to the variables and display the values of the record on a picturebox. (6 marks)

Variable	Value
CustomerName	Alex
AccNo	2005
Balance	20000

QUESTION SIX

- a) State the prefix used for each of the following visual basic controls:
- i. Combo box;
 - ii. List box;
 - iii. Vertical scroll bar;
 - iv. Form. (2 marks)
- b) State whether or not each of the following visual basic variable names are valid justifying your answer in each case:
- i. Registration number;
 - ii. 2Hello_world; (2 marks)
- c) State the function of each of the following controls in a Visual Basic program.
- i. pointer;
 - ii. frame ;
 - iii. ole;
 - iv. combo box. (4 marks)
- d) Table 1 shows a list of colors that should be displayed on a form when a user enters a specified capital letter corresponding to the color. Use it to answer the question that follows.

LETTER	BACKGROUND COLOUR
R	RED
G	GREEN
B	BLUE
Y	YELLOW
ANY OTHER LETTER	NOT VALID COLOUR

Table 1

Write a Visual Basic program that would accept the letter and change the background colour of the form to the corresponding colour when a user clicks on a command button. Use an *If statement* and attach the code to a command button. (6 marks)

- e) State the purpose of each of the following properties of a timer control in Visual Basic programming language.
- i. Interval;
 - ii. Enabled. (2 marks)
- f) Write a Visual Basic program that would generate the following numbers as an output on a form. Use *the for....next* statement. (4 marks)

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

QUESTION SEVEN

- a) Anita would like to **use procedures** to develop an application in Visual Basic. Outline **four** benefits she would achieve from this. (4 marks)

- b) Write a Visual Basic program that would accept a number through a text box. The program should then compute the square and the square root of the number and display the output in a label with the following description:

"The square of "number" is "square" and its square root is "square root".

Where the **number**, **square** and **square root** are values derived from the code. Attach the code to a command button. (6 marks)

- c) Distinguish between *module level variable* and *local variable* as used in a Visual Basic. (4 marks)

- d) Rewrite the following mathematical expression to its Visual Basic equivalent

$$P = \frac{\sqrt{x} / e^{3x}}{\cos(2x)} \quad (2 \text{ marks})$$

- e) Study the following Visual Basic program code and then answer the question that follows:

```
Private Sub cmdAdd_Click()  
    Dim Num As Single  
    Num = InputBox("Enter an Integer")  
    Num = Num + 1  
    Num = (Num + 4) mod 4  
    picbox. Print Num  
End Sub
```

Interpret the program given that the input value is 22. (4 marks)

QUESTION EIGHT

- a) Sketch the output produced when the following visual basic statement is executed.

Marks = InputBox("enter a student mark", "student mark", 0) (2 marks)

- b) Assuming a visual basic environment, evaluate the expression.

MyVal = x ^ y * a mod b \ c given that x=5, y=3, a=2, b=15, c=5 (2 marks)

- c) Write a visual basic program that would prompt the user to enter admission number, name and marks scored by a student in three subjects. The program should then compute the students average mark and output the admission number, name, total marks and average marks each separated by 5 tabs on a form. Attach the code to a command click event. (6 marks)

- d) Distinguish between Fix() and Int() functions as used in visual basic programming language. (2 marks)

- e) During a visual basic Programming lesson, students were required to write a program that could accept registration number, age, and sex of a student through the use of text boxes. The program would then check the age entered and then output either “You are Mature” or “You are under age” on a label when the age is greater than or equal to 21 or otherwise respectively. The program is attached to a command click event.
- i. Sketch a possible design of the user interface of the program. (2 marks)
 - ii. Draw a flowchart to represent the program logic. (2 marks)
 - iii. Write a visual basic program to implement the interface. (4 marks)