



# MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SECOND TERM EXAMINATION FOR

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

2920/205: VISUAL PROGRAMMING

DATE: 9/6/2021

TIME: 8.30-11.30 AM

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## INSTRUCTIONS

Answer any FIVE questions

Don't write on this question paper

## QUESTION ONE

- a) Write a program in Visual basic that allows a user to enter numerical values into a 4x4 matrix using an array. Each value in the matrix is to be displayed in a picture box. Use the *for loop* statement and attach the code to a command button. (7 marks)
- b) State a circumstance when each of the following textbox properties are used in visual basic program.
- PaasswordChar;
  - KeyPress;
  - LostFocus. (6 marks)
- c) 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)
- d) With the aid of a flowchart, explain a for.....next loop. (3 marks)

## QUESTION TWO

- a) Write the equivalent Visual Basic statement for each of the following mathematical expressions.
- i.  $\frac{G^2}{R} \times \frac{D}{\sqrt{C-V}}$  (2 marks)
- ii.  $G \times \frac{m_1 \times m_2}{d^{10}}$  (2 marks)
- b) Outline the use of each of the following built-in functions:
- i. Rnd()  
ii. Abs()  
iii. Rtrim()  
iv. Str() (8 marks)
- c) A cybercafé charges kshs 2.50 per minute for the first 30 mins, kshs. 2.0 per min for additional 10 mins, and kshs. 1.50 for each additional minute. Using the If statement write a visual basic program that accepts the number of minutes of the session using an input box() and outputs the length of the session cost on a label. Attach the code to a command button. (8 marks)

## QUESTION THREE

- a) Write the general syntax for a user defined function as used in visual basic. (2 marks)
- b) Explain each of the following components of a message box function as used in Visual Basic programming:
- i. Prompt;  
ii. Buttons;  
iii. Title. (6 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. (7 marks)
- d) Rewrite the following section of a visual basic program code using *select case* statement
- ```
If Age = 5 Then  
Print "Five years old"  
Elseif Age >= 13 and Age <= 19 Then
```

```

Print "Teenager"
Elseif (Age >=20 and Age <= 35) or Age = 50 or _
(Age >= 60 and Age <= 65) Then
Print "Adult"
Elseif Age > 65 Then
Print "Senior citizen"
Else
Print "Everyone else"
End if

```

(5 marks)

#### QUESTION FOUR

- a) Explain a circumstance in which each of the following are used in arrays in visual basic programming;
- i. Option Base;
  - ii. To.
  - iii. Preserve (6 marks)
- b) Write a program in visual basic that prompts a user to enter 10 names of students into an array using an inputbox() and displays the names on a listbox in the reverse order. Attach the code to a command click event. (6 marks)
- c) The sum of all the odd numbers from 1 to n is required. Write a visual basic program that prompts for the value of n through the inputbox(). The program should then calculate the sum of all odd numbers less than n and display the results on a picture box. Use a do....while loop. (8 marks)

#### QUESTION FIVE

- a) In a visual basic program a variable A holds value 5 and variable B holds 10. State the steps to determine the output for each of the following statements;
- i. Not (A < 3) Xor (B>4)
  - ii. Not (A x B) < (B + 2 x A) And (B + A > (2 x A +B)). (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. (5 marks)

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

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

Where  $\pi$  is a mathematical constant 3.14 and r is its radius. Write a program in Visual Basic that accepts a radius from a textbox and passes the value to a function which 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) Write a visual basic program that would prompt the user to input fees paid by five students. The program should then compute the total fees paid and output the results through a message box. Attach the code to a command click event. Use the Do While...loop.

(5 marks)

### QUESTION SIX

- a) Distinguish between *user defined* and *system defined* constants as used in Visual Basic programming. (4 marks)
- b) The table below shows letters with their corresponding messages. Use it to answer the questions that follow.

| letters          | Message                   |
|------------------|---------------------------|
| A                | My name is Amina          |
| B                | I love playing ball games |
| C                | Cat are my best pets      |
| Any other letter | Not a valid letter        |

Write a Visual Basic program that will accept a letter through an input box and display the appropriate message through the use of a picture box control. Use an *if-else* statement.

(8 marks)

- c) Write a visual basic program that could display even numbers between 0 and 100. The program then computes and displays the sum of the numbers through a label. Attach the code to a command click event. (6 marks)

- d) Assuming a visual basic environment, evaluate the expression

$$\text{Num} = a - b * \text{sqr}(c)/d \quad \text{given that } a = 2, b = 3, c = 25, d = 5 \quad (2 \text{ marks})$$

## QUESTION SEVEN

- a) State the prefix used for each of the following visual basic controls:
- Combo box;
  - List box;
  - Vertical scroll bar;
  - Form. (2 marks)
- b) Table 1 shows various visual basic controls and their associate properties, explain the function of each of the properties. (6 marks)

| Control Name   | Properties               |
|----------------|--------------------------|
| Command Button | Default<br>Tool Tip Text |
| CheckBox       | Value<br>Visible         |
| Picturebox     | Autosize<br>picture      |

Table 1.

- c) Write a visual basic program that would generate the following output on a form, use the for loop and attach the code to a command click event. (4 marks)
- ```
2    3    4    5
3    4    5    6
4    5    6    7
5    6    7    8
```
- d) State whether or not each of the following visual basic variable names are valid justifying your answer in each case:
- Registration number;
  - 2Hello\_world; (2 marks)
- e) Write a visual Basic Program that accepts a text through a text box. The program should then display the following on a picture box.
- The text in uppercase;
  - The last three characters of the text;
  - Extract three characters starting from Second character.
- Attach the code to a command click event. (6 marks)

## QUESTION EIGHT

- 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) Table 2 shows the grading system in Machakos University College. Write a Visual basic program that would prompt a user to enter the grade obtained by a student through the use of input box. The program then outputs the corresponding remark through the use of a message box. Use the *Case* control structure and attach the code to a command click event. (6 marks)

Grade	Remark
A	Distinction
B	Credit 1
C	Credit 2
D	Pass
E	Fail

**Table 2.**

- c) Rewrite the following mathematical expression to its Visual Basic equivalent  
$$P = \frac{\sqrt{x} / e^{3x}}{\cos(2x)}$$
 (2 marks)
- d) Study the following visual basic program code then answer the questions that follow:
- ```
Private sub cmdinteger_click()  
Dim Val1 as Single  
Val1 = inputBox("Enter an integer")  
Val1 = Val1 + 1  
Val1 = (Val1 + 4) mod 4 - 2 * 3  
Picbox.Print Val1  
End Sub
```
- i. Interpret the program;
- ii. Assuming Val1 = 15, State the output generated, (4 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. Draw a flowchart to represent the program logic. (2 marks)
- ii. Write a visual basic program to implement the interface. (4 marks)