KASNEB

DICT LEVEL II

PROGRAMMING CONCEPTS

TUESDAY: 22 November 2016. **Time Allowed: 3 hours.**

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Answer ALL questions. Marks allocated to each question are shown at the end of the question.

ALL programs written should be in Visual Basic programming language.

QUESTION ONE

(a) Explain the following terms as used in programming:

(i) Loader. (2 marks)
(ii) Linker. (2 marks)
(iii) Data type. (2 marks)
(iv) Built in functions. (2 marks)

(b) In each case, describe the expected output of the following pseudocodes:

(i)
```
start1 = 1
txtDisplay.text = " "
Do until start1 > 10
    txtDisplay.text = txtDisplay.text +start1.ToString+vbNewline
start1=Start1 + 1
Loop
```
(2 marks)

(ii)
```
dim surname as string
  surname = txtsurname.text
dim age as integer
   age = Convert.ToInt32 (txtsurname.text)
```
(2 marks)

(c) Write Visual Basic programs to accomplish the following tasks:

(i) Populate a combo box called comboContinents with any three names of continents. (3 marks)

(ii) Load an image named "mine" in the joint photographic expert group format to fit the picture control box named "imgMyPicture". The image is stored in drive C on clicking a button called "cmdPicture". (3 marks)

(d) Write the output to the following Visual Basic Code:

```
Dim Dog as String = "Jimmy the dog"
Dim Cat as String = "Peet the cat"
MessageBox ("Here I have" &Dog& "and" & Cat).
```
(2 marks)

(Total: 20 marks)

QUESTION TWO

(a) Discuss two factors to consider when designing a user interface. (6 marks)

(b) Describe four types of documentation with respect to software application development. (8 marks)

(c) Consider the following Visual Basic code:

```
Public Class Form1
Private Sub Button1_Click(ByVal sender As System.Object,
            By Val As System.EventArgs) Handles Button1.Click
  Dim Check As boolean
  Dim Count As Integer
  Dim Str As String
End sub
End class
```

Required:
Rewrite the code such that when the program is executed a message box displays the following:

(i) "True" for variable Check. (2 marks)

(ii) 100 for the variable Count. (2 marks)

(iii) "Stringtest for variable Str. (2 marks)

(Total: 20 marks)

QUESTION THREE

(a) Highlight four principles that could be used to make your program readable. (4 marks)

(b) Citing an example in each case, describe the following types of algorithms in the context of computer programming:

(i) Simple recursive algorithms. (4 marks)

(ii) Divide and conquer algorithms. (4 marks)

(c) Padalinks Company Limited pays its employees as follows:

Basic salary	**Number of days worked x Rate per day**
Allowances	
Transport allowance	1% of basic salary
House allowance	2% of basic salary

Deductions	
National Social Security Fund (NSSF)	2.5% of gross pay
Pay As You Earn (PAYE)	3% of gross pay (for workers earning gross pay in excess of Sh.10,164)

Required:
Draw a flow chart to compute the net pay. (8 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Explain the following characteristics of a good programming language:

(i) Simplicity. (2 marks)

(ii) Naturalness. (2 marks)

(iii) Abstraction. (2 marks)

(iv) Efficiency. (2 marks)

(b) (i) Outline three benefits of using concurrent programming approach. (3 marks)

(ii) Enumerate three characteristics of the imperative programming languages paradigm. (3 marks)

(c) Write Visual Basic code segments to perform each of the following mathematical computations and display the output using a message box:

(i) 2^4. (2 marks)

(ii) 15 remainder 4. (2 marks)

(iii) $19 \div 4$. (2 marks)

(Total: 20 marks)

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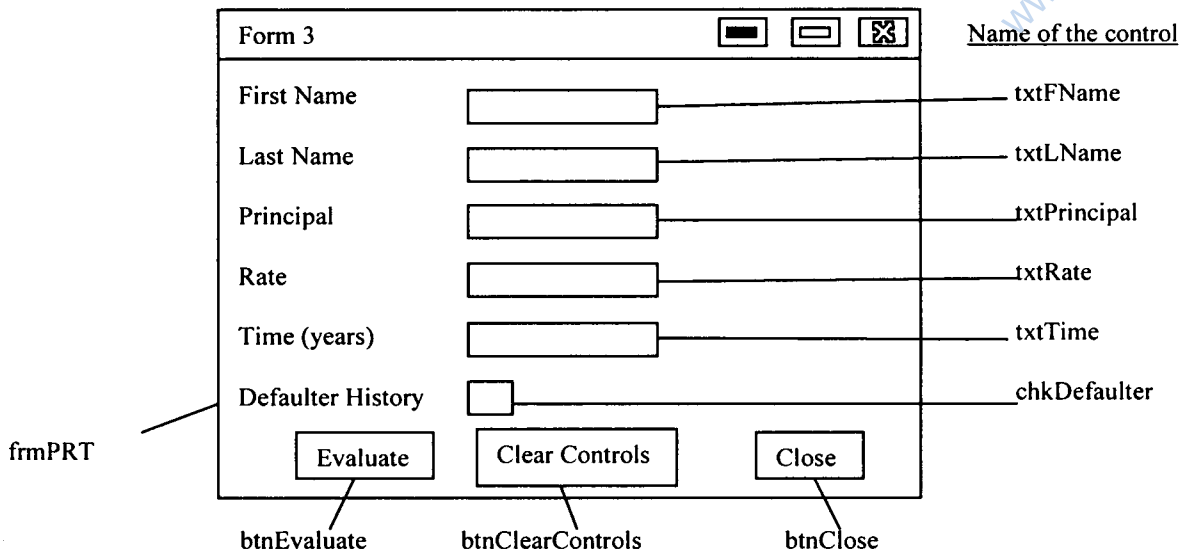
QUESTION FIVE

(a) Analyse four characteristics of fourth generation programming languages. (4 marks)

(b) The graphical user interface (Form 3) shown below could be used to calculate simple interest for a bank loan. If a client has a history of being a defaulter, the interest rate is set at 19% of the amount borrowed otherwise the interest rate is set at 15% of the amount borrowed.



Required:

(i) Write Visual Basic code for "btnClose" button to close form 3. (2 marks)

(ii) Write Visual Basic code for "btnClearControls" button. (2 marks)

(iii) Draw a flow chart for the above problem. (5 marks)

(iv) Using an IF statement, write code for the checkbox event to display 19% to "txtRate" if the checkbox is checked, otherwise display the default rate of 15%. (3 marks)

(v) Write Visual Basic code to display first name, last name and calculated simple interest in a message box pop-up.

Note: Simple interest = Principal x $\frac{\text{Rate}}{100}$ x Time in years.

(4 marks)

(Total: 20 marks)

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