

ICT2611

May/June 2019

Graphical user Interface Programming

Duration 2 Hours

70 Marks

EXAMINERS

FIRST

SECOND

DR VZ MZAZI

MRS MA SEPUDUMO

Closed book examination

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Instructions

- The question paper consists of five pages including the cover page
- Answer all questions in the answer book
- Answer all multiple choice questions in the answer book
- Marks are given in brackets next to the question
- Good Luck!

[PLEASE TURN OVER]

Question 1 [10 marks]

1 1 What will be the content of the variable x after the following VB Net statement is executed

$$x = (32 + 16) / (3 * 2) + 2$$

- A 4
- B 8
- C 10
- D 16

1 2 The for-loop programming construct is used for the following purposes

- A It is a decision construct
- B It is a construct for repetition and decision
- C It is a construct for repetition
- D It is used for exception handling

1 3 In VB Net the character [] is used to assign an access key to a control

- A &
- B @
- C *
- D None of the above

1 4 Which procedure returns a value in VB Net

- A Procedure
- B Function
- C Subprocedure
- D ByRef

1 5 The [] control in VB Net is used to process code at regular intervals

- A Watch
- B Counter
- C Clock
- D None of the above

1 6 The following event occurs when a form is closed

- A Click
- B OnClose
- C Keypress
- D FormClosing

1 7 Inheritance makes the following possible

- A Reuse of existing code
- B Exception handling
- C Hide internal details of a class
- D All of the above

1 8 Which of the following is not a valid step in the creation process of an OOED application?

- A Meet with client
- B Build the user interface
- C Code application
- D None of the above

1 9 Passing a parameter to a program ByVal means the following

- A A copy of the variable is made for the procedure
- B A reference to the variable is made for the procedure
- C Only numeric parameters are allowed
- D None of the above

1 10 If you do not provide a data type when declaring a variable, which data type is automatically assigned by Visual Basic

- A String
- B Integer
- C Object
- D None of the above

Question 2 [30 marks]

You are required to write a water billing program. Two readings in kiloliters are entered into textboxes called `old_reading` and `new_reading`. A button `calculate_bill` is used for calculating the bill, and a label called `your_bill` must be used to show the billing for the month. The monthly water bill is calculated as follows: Consumption of up to and including 6 kiloliters costs R60 per kiloliter. Consumption over 6 kiloliters to and including 11 kiloliters costs R40 per kiloliter. Consumption over 11 kiloliters costs R25 per kiloliter. Here is an example: a person who used 8 kiloliters will pay R60 per kiloliter for the first 6 kiloliters and an additional R40 per kiloliter for the other 2 kiloliters consumed.

2.1 Draw a suitable layout for the interface of this program. [5 marks]

2.2 Write a flow chart for the algorithm for calculating the water bill. [10 marks]

2.3 Write the Visual Basic code for a procedure that implements this flow chart. [15 marks]

Question 3 [10]

Given an input string such as INF1511, write a Visual Basic net function to calculate the sum of the indexes of the letters in the input string. For INF1511 the answer is $9 + 14 + 6 = 29$. The function skips numbers. The indexes of the letters are given by their position in the alphabet {a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z}.

Question 4 [10]

Consider Table 2 below, with 5 rows and 7 columns, in which, each cell is either valid (V) or invalid (I). Assume the values in Table 2 are stored in a multi-dimensional array. Write a procedure using the nested `For` ... `Next` statement, to calculate the percentage of valid cells in the table. The formula to calculate the percentage of valid cells is

$$(\text{number of valid cells} / \text{total number of cells}) * 100$$

	0	1	2	3	4	5	6
0	V	I	V	I	V	V	I
1	I	I	V	I	V	V	V
2	I	V	I	V	I	I	V
3	V	V	I	V	I	V	V
4	I	V	I	I	V	V	I

Table 1

Question 5 [10]

5.1 Exception classes are used for error handling. List five examples of exception classes in VB.Net. [5]

5.2 Give the basic outline of the code for exception handling in VB.Net. [5]