

DICT LEVEL II

PROGRAMMING CONCEPTS

TUESDAY: 28 November 2017.

Time Allowed: 3 hours.

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) (i) State the function of the "OnError GoTo" line used in a Visual Basic Code. (2 marks)
- (ii) Write the general syntax of an error handler code with a line label as used in Visual Basic programming language. (4 marks)
- (b) Differentiate between each of the following pair of terms as used in Visual Basic:
- (i) "Intrinsic control" and "activeX control". (2 marks)
- (ii) "Image box" and "picture box". (2 marks)
- (iii) "Floating window" and "docking window". (2 marks)
- (c) Explain the meaning of the following terms as used in programming:
- (i) Translator. (1 mark)
- (ii) Interpreter. (1 mark)
- (d) Write a Visual Basic program named "FindFactor" that uses a For...Next loop to find the prime factor(s) of an integer number entered by the user and display the solution in a list box. (6 marks)

(Total: 20 marks)

QUESTION TWO

- (a) Consider the table below:

Operator	Description	Example
^		
-		
/		
\		
MOD		

Required:

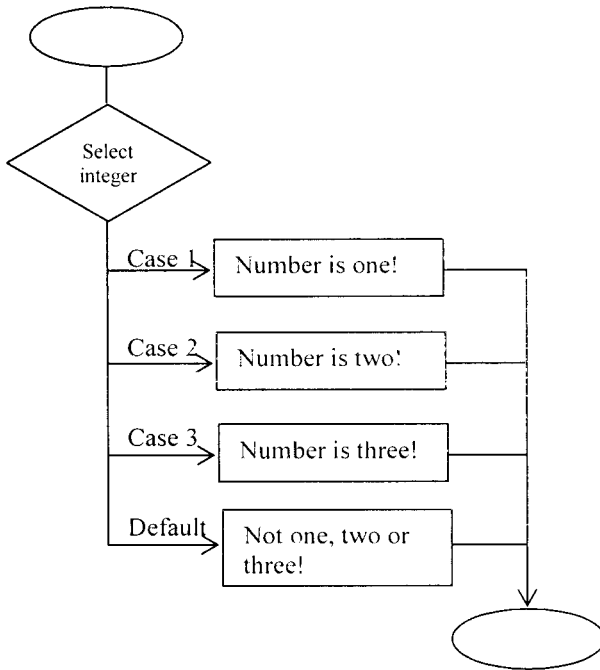
Using variable A = 2 and variable B = 7, complete the above table.

(5 marks)

- (b) (i) Describe the function of an If...Then...Else selection structure in Visual Basic programming language. (2 marks)
- (ii) Show the syntax of an If... Then...Else selection structure as used in Visual Basic programming language. (3 marks)
- (iii) Write a code snippet which uses the If... Then...Else selection structure to determine whether a value is greater than 50. If the value is greater than 50, the program displays "Pass" in a text box named "Grade" else it displays "Fail". (2 marks)

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- (c) Write a Visual Basic method for adding three countries namely; Kenya, Uganda and Tanzania to a list box (3 marks)
- (d) Consider the flow diagram below which depicts a Select Case statement:



**Required:**

Convert the flow chart into a Visual Basic code.

(5 marks)

**(Total: 20 marks)**

**QUESTION THREE**

- (a) Outline four functions of a compiler. (4 marks)
- (b) Highlight four advantages of procedural programming. (4 marks)
- (c) Enumerate circumstances under which each of the following errors could occur in visual programming:
- (i) Syntax errors. (2 marks)
  - (ii) Run-time errors. (2 marks)
  - (iii) Logic errors. (2 marks)
- (d) You have been provided with the Visual Basic user interface below:

FORM1		- <input type="checkbox"/> X
Name:	<input style="width: 80%;" type="text"/>	
Password:	<input style="width: 80%;" type="text"/>	
Enter:	<input style="width: 80%;" type="text"/>	

**Required:**

Write a Visual Basic program that prompts the user to enter the name "Molly" and the password "5555". If both the name and password are correct then the program displays the word "Welcome", otherwise it displays "Access denied" in the text box labelled "Enter".

(6 marks)

**(Total: 20 marks)**

**QUESTION FOUR**

- (a) Outline four steps that you would take to develop a computer program. (4 marks)
- (b) Write the expected output after the execution of the following Visual Basic statements:

```
Subject = " Visual Basic "  
Print LTrim& (Subject)  
Print Trim& (Subject)  
Print Ucase (Subject)  
Print RTrim$ (Subject)
```

(4 marks)

- (c) You have been hired by Bridget Health Care Nursing Home to develop an application to be used in the hospital. The program is supposed to calculate the Body Mass Index (BMI) for the patient. BMI is calculated using the following formula:

$$\text{BMI} = \text{weight (kgs)/height (in meters)/12.}$$

The table below shows the BMI values and status of the patient:

Value	Patient status
Less than or equal to 18.5	Under weight
Greater than 18.5 but less than 24.9	Normal weight
Greater than 24.9 but less than 29.9	Overweight
Greater than 29.9	Obese

**Required:**

- (i) Draw a graphical user interface to enter the height and weight of a patient, calculate and display the BMI values and the status of patients in textboxes on the click of a command button. (4 marks)
  - (ii) Convert the graphical user interface drawn in (c) (i) above in to a Visual Basic code. (6 marks)
  - (iii) Highlight two design tools that you might have used during the design of the program in (c) (ii) above. (2 marks)
- (Total: 20 marks)**

**QUESTION FIVE**

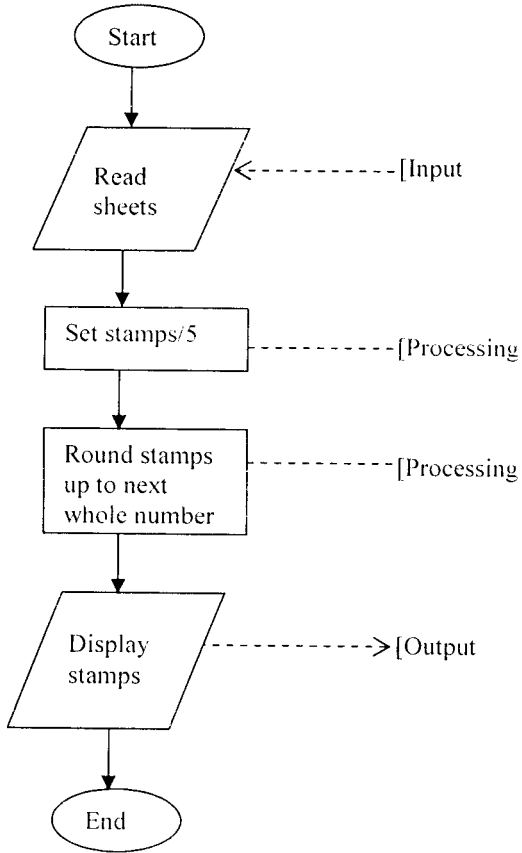
- (a) Outline four factors to consider when designing a user interface. (4 marks)
- (b) Assume that variable A holds the value 60 and variable B holds the value 13.

**Required:**

Compute the following:

- (i)  $A < 80 \text{ OR } B = A.$  (1 mark)
- (ii)  $A > 80 \text{ AND } B < A.$  (1 mark)
- (iii)  $A < 80 \text{ XOR } B < A.$  (1 mark)
- (iv)  $\text{NOT } A > B.$  (1 mark)

(c) Convert the flowchart below into a pseudocode:



(4 marks)

(d) Outline the steps followed while designing an algorithm.

(4 marks)

(e) Using appropriate control structures, create two functions in Visual Basic for finding the sum and average of a set of "n" values.

(4 marks)

**(Total: 20 marks)**

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