



kasneb

**DICT LEVEL II**

**PROGRAMMING CONCEPTS**

**WEDNESDAY: 27 November 2019.**

**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) Explain the function of a project explorer window in visual basic programming. (2 marks)
- (ii) Outline two distinct modes that could be assumed by a visual basic project. (2 marks)
- (b) Describe each of the following algorithms as applied in programming:
- (i) Divide and conquer. (2 marks)
- (ii) Dynamic method. (2 marks)
- (c) Study the code extracts given below:
- (i) LDA N  
MOV AX, 15  
SUB AX, 10
- (ii) 111 00011 00000001 1000 0011  
000111 00 10001101
- (iii) DO  
Counter = Counter + 1  
Print Counter  
Loop Until Counter = 10  
End Sub

**Required:**

Identify the type of programming language and the generation of the language used in each of the extracts. (6 marks)

- (d) Write a Visual Basic program that allows a user to enter the strings “Kasneb” and “1234” into respective text boxes in a login screen. If the two are valid, a form named frmMain is opened, otherwise a message “Invalid name or password” is displayed on a message box.

Attach the code to a command button.

(6 marks)

**(Total: 20 marks)**

**QUESTION TWO**

- (a) Outline six advantages of using structured programming languages in program development. (6 marks)
- (b) State four types of user documentations used in program development. (4 marks)

(c) Consider the user interface below:

The image shows a window titled "Area of a Circle" with a standard Windows-style title bar (minimize, maximize, close buttons). Inside the window, there are four labels on the left: "Radius", "Diameter", "Circumference", and "Area". To the right of each label is a rectangular text input field. At the bottom of the window, there are three buttons: "Compute", "Clear", and "Exit".

**Required:**

(i) Write a Visual Basic program that computes the area, diameter and circumference of the circle when you enter the radius. (5 marks)

**Note:**

$$\text{Diameter} = \text{radius} \times 2$$

$$\text{Circumference} = 2 \times \pi \times \text{radius} \text{ where } \pi = 3.142$$

$$\text{Area} = \pi \times \text{radius}^2$$

(ii) Write a Visual Basic code that clears the contents of all the textboxes when you click the Clear button. (3 marks)

(iii) Write a Visual Basic code that exits the program when you click the Exit button. (2 marks)

**(Total: 20 marks)**

**QUESTION THREE**

(a) Explain each of the following programming paradigms:

(i) Concurrent programming. (2 marks)

(ii) Functional programming (2 marks)

(iii) Event driven programming. (2 marks)

(b) Describe each of the following terms as used in programming:

(i) Linker. (2 marks)

(ii) Semantics. (2 marks)

(c) Explain two ways of passing parameters in a function. (4 marks)

(d) Using a CASE statement, write a program to compute and display the tax payable on an employee's gross income given the following information.

Gross income	Tax payable
0 to 10,000	Amount not taxable
10,001 to 30,000	Tax rate is 10%
30,001 to 40,000	Tax rate is 12%
40,001 to 50,000	Tax rate is 15%
Greater than 50,000	Flat rate tax of 20%

(6 marks)

**(Total: 20 marks)**

#### QUESTION FOUR

(a) State the names of each of the following visual basic icons used in message boxes:

(i)  (1 mark)

(ii)  (1 mark)

(iii)  (1 mark)

(iv)  (1 mark)

(b) Describe three situations that could trigger the initiation of software development in an organisation. (6 marks)

(c) Bidii Savings Society (BSS) Ltd. members' total savings are made up of cash deposits in BSS Bank account and shares at the Society. The Society pays 5% interest on shares exceeding 100,000 and 3% on shares that do not meet this target. However, no interest is paid on deposits in the members' BSS Bank account.

**Required:**

Draw a flowchart for a program that would prompt a user to enter name, shares and deposits of a member and then calculate interest and total savings. The program should output the member's name, total savings and interest on the screen. (6 marks)

(d) Compare an interpreter and a compiler based on the following parameters:

(i) Speed. (2 marks)

(ii) Ease of debugging. (2 marks)

**(Total: 20 marks)**

#### QUESTION FIVE

(a) Describe the following debugging techniques:

(i) Step-into. (2 marks)

(ii) Step-over. (2 marks)

(iii) Step-out. (2 marks)

(b) Differentiate the following Visual Basic controls:

(i) Groupbox and Panel. (4 marks)

(ii) Listbox and Listview. (4 marks)

(c) The Visual Basic code below is intended to increment numbers in an array whose values are greater than 10 otherwise output zero.

```
Dim numbers [12,10,8,32,64,9]
```

```
Dim j
```

```
for j = 0 till 4
```

```
  If (numbers [j] > 10)
```

```
    total + = numbers [j]
```

```
  Else
```

```
    Numbers [j] = 0
```

```
  End
```

```
Loop
```

**Required:**

(i) Rewrite the code above without errors. (4 marks)

(ii) Explain the type of error (s) you have identified above. (2 marks)

**(Total: 20 marks)**