kasneb

DICT LEVEL II

PROGRAMMING CONCEPTS

TUESDAY: 31 August 2021. **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) List two examples of each of the following operators:

(i) Concatenation operators. (2 marks)

(ii) Logical operators. (2 marks)

(b) Suggest the data type you would use for each of the following tasks:

(i) To store the name of a student. (1 mark)

(ii) To measure the distance covered by the student to and from college in metres. (1 mark)

(iii) To count the number of books the student borrowed from the library. (1 mark)

(iv) To predict if the weather is either rainy or sunny. (1 mark)

(c) Explain the meaning of each of the following terms as used in programming:

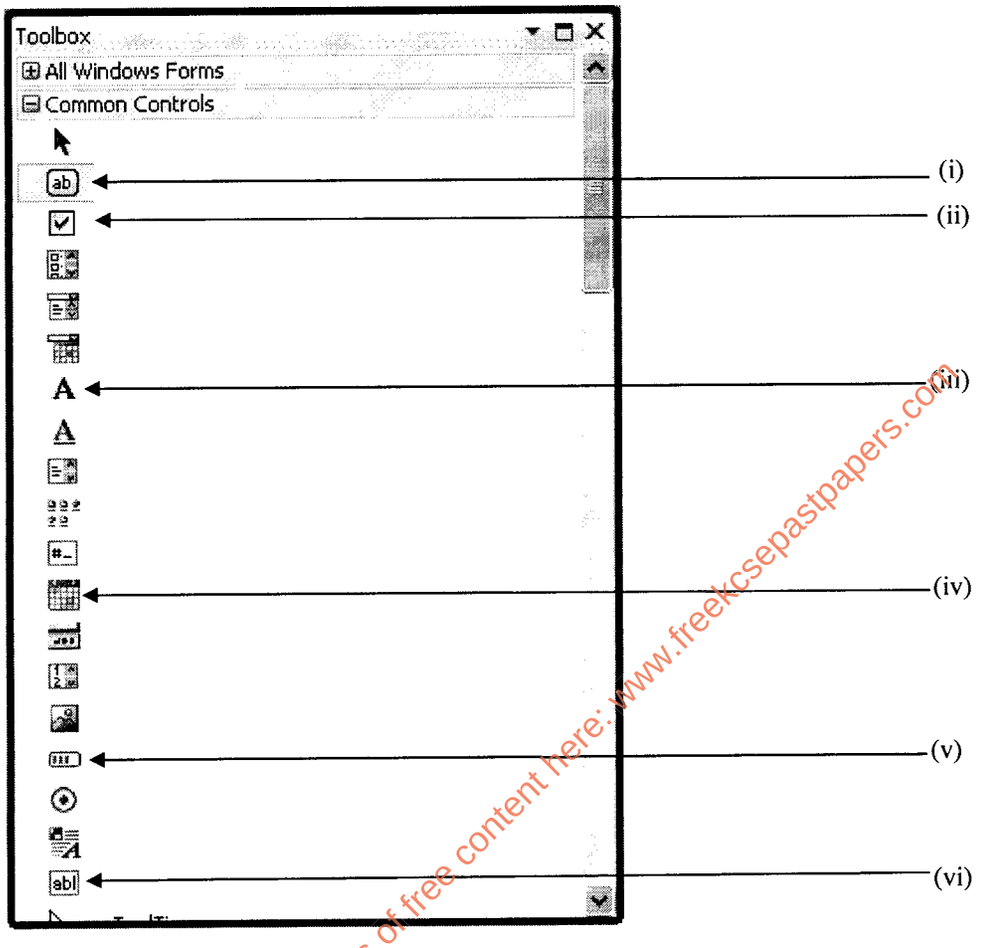
(i) Online compilation. (2 marks)

(ii) Mnemonics. (2 marks)

(iii) Pre-processing. (2 marks)

(d) The figure below shows a Visual Basic toolbox with some controls:

Required:
Name the parts labelled (i) to (vi).



(6 marks)
(Total: 20 marks)

QUESTION TWO

(a) Study the Visual Basic procedure given below:

```
cmdPush_Click ( )
(i)  (ii)  (iii)  (iv)
```

Required:
Name the parts labelled (i) to (iv). (4 marks)

(b) Explain when each of the following types of errors occur in a Visual Basic programming environment:

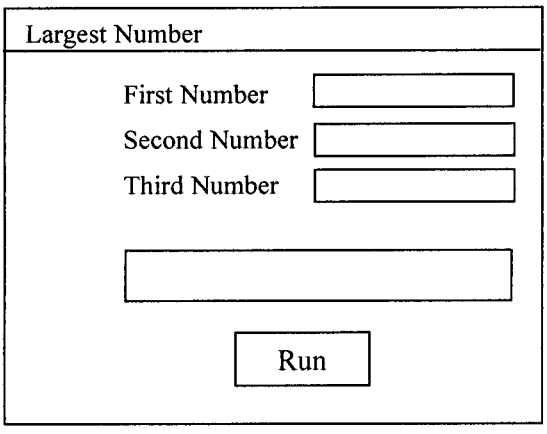
(i) Compile error. (2 marks)

(ii) Runtime error. (2 marks)

(iii) Logical error. (2 marks)

(c) Highlight five common properties applicable to controls in Visual Basic programming. (5 marks)

(d) The form below was designed by a student to assist in determining the largest of three numbers input by the user and output the result in a text box when the Run command button is clicked:



Required:
Write a Visual Basic program to implement the above design. (5 marks)
(Total: 20 marks)

QUESTION THREE

(a) Distinguish between fourth and fifth generations of programming languages. (2 marks)

(b) (i) Explain the meaning of the term "artificial intelligence". (2 marks)

(ii) Describe the programming approach used in artificial intelligence. (2 marks)

(c) A programmer has attached code to a command1 button to divide two numbers; int_value1 = 10 and int_value2 = 0. However, on execution, the following line caused an error:

```
Form1.Print intValue1/int_value2
```

Required:
(i) State the nature of the error. (1 mark)

(ii) Using a "go to" statement, write code with an error handling mechanism to troubleshoot the above error. (5 marks)

(d) (i) Define "pseudocode" as used in programming. (2 marks)

(ii) Consider the pseudocode below for computing the average marks as they are keyed in by a user:

```
Initialise total to zero
Initialise counter to zero
Input the first mark
while the user has not entered the last value
  add this mark into the running total
  add one to the mark counter
input the next mark
End while
  Set the average to the total divided by the counter
Print the average (Display in a text box)
```

Required:
Convert the pseudocode into a Visual Basic program. (6 marks)
(Total: 20 marks)

QUESTION FOUR

(a) Outline four conditional compilation options used in testing of a program in Visual Basic. (4 marks)

(b) Highlight three differences between a local variable and a global variable. (6 marks)

(c) Highlight four characteristics of a good computer program. (4 marks)

(d) The table below shows the peaks of Mt. Kenya:

Batian
Nelion
Lenana

Required:

Write a Visual Basic program that will read and populate the above information into a list box. Ensure the list box is cleared. (6 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Explain the following types of file extensions generated by visual studio:

(i) .vb (2 marks)

(ii) .config (2 marks)

(iii) .vbp (2 marks)

(iv) .vbw (2 marks)

(b) The table below shows the traffic code, traffic alert and the corresponding colour:

Traffic code	Traffic alert	Colour
1	STOP	Red
2	READY	Orange
3	GO	Green

A Visual Basic program is required that accepts the traffic code through a text box. The program then displays the traffic alert on a button with a corresponding background colour. Other traffic code entries should be denied and an appropriate pop-up message displayed.

Required:

(i) Draw a flowchart for the above program. (6 marks)

(ii) Write a Visual Basic program that uses a Select Case control structure. (6 marks)

(Total: 20 marks)

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