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DICT LEVEL II

PROGRAMMING CONCEPTS

TUESDAY: 27 November 2018. **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) Define the following terms as used in Visual Basic programming language:

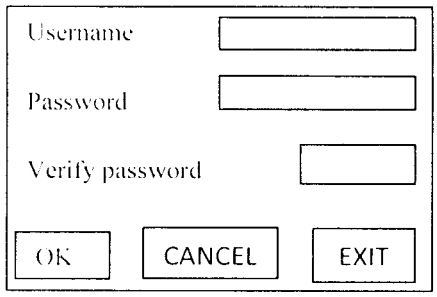
(i) Key trapping. (2 marks)

(ii) General procedures. (2 marks)

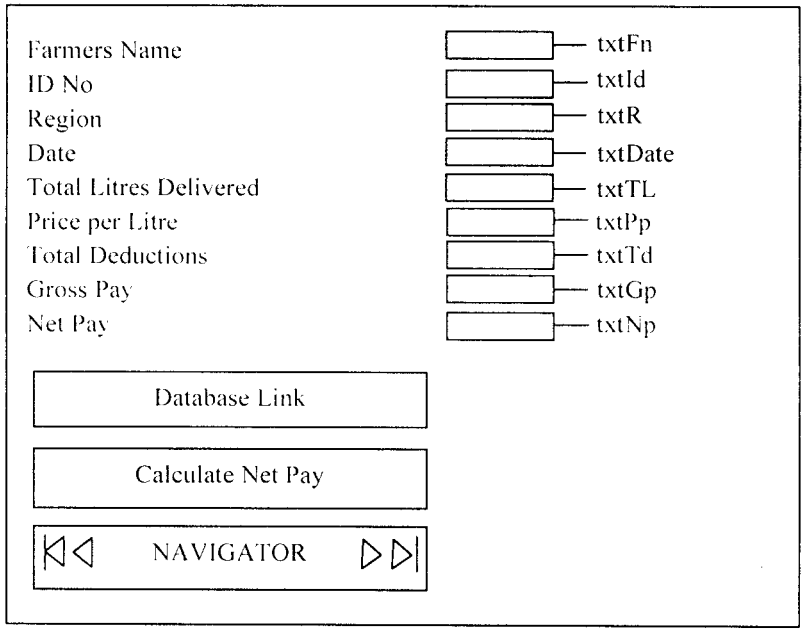
(iii) Branching statements. (2 marks)

(b) You have been tasked to develop a registration system for dairy farmers. The graphical user interfaces below will form part of the system.

LOGIN - FORM



PAYMASTER – FORM



Required:

(i) Write a Visual Basic procedure that could be used to test the legitimacy of user using username "farmer" and password "password@2018". (4 marks)

(ii) Write a Visual Basic command (cmdCalc) procedure to compute a farmer's net pay when "Calculate Net Pay" button is clicked. (6 marks)

(iii) Using ADO control, write a Visual Basic command (cmdConnect) procedure to link the farmers paymaster-form to a table (data) which is stored in a database saved as "Farmers" in drive D (D:\). (4 marks)

(Total: 20 marks)

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QUESTION TWO

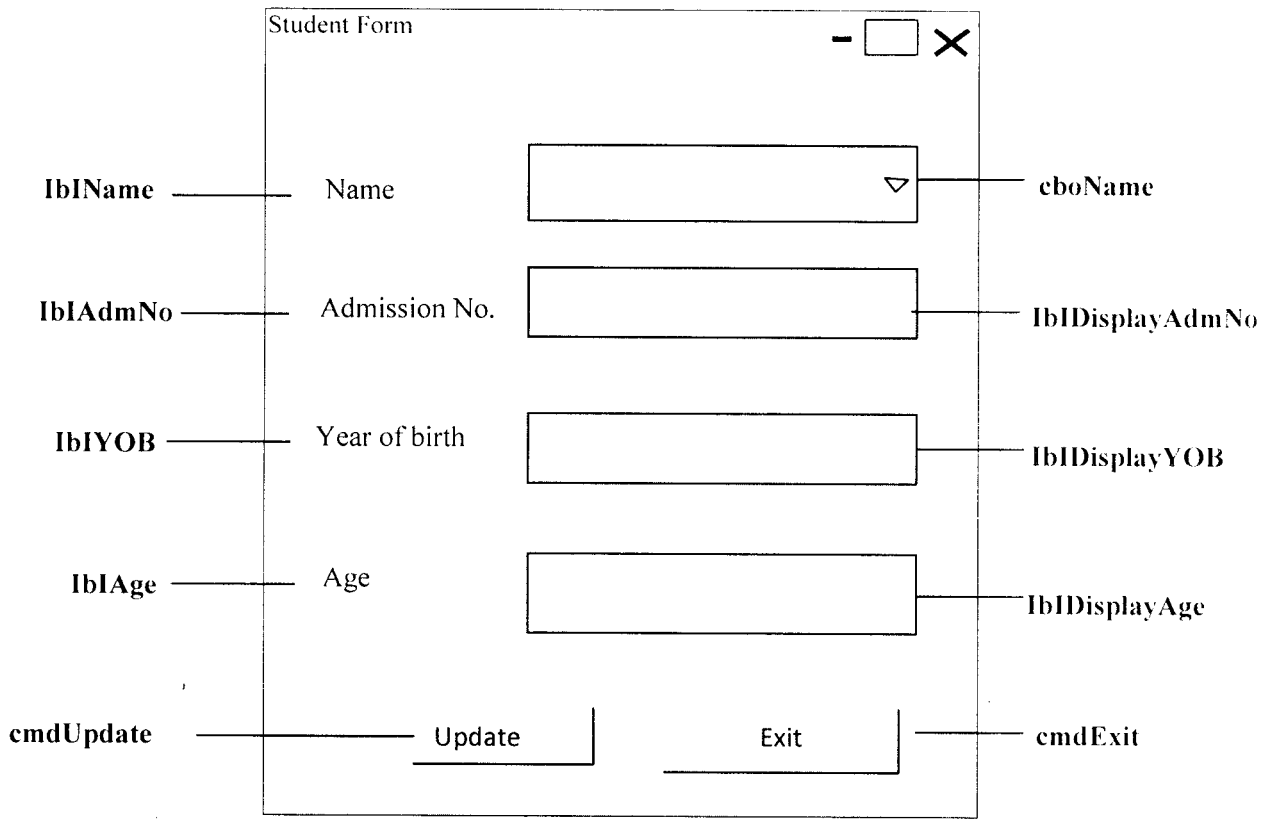
(a) Explain the effect on variables of using the following key words in Visual Basic declarations:

(i) Private variableName As Datatype. (2 marks)

(ii) Static variableName As Datatype. (2 marks)

(iii) Public variableName As Datatype. (2 marks)

(b) A student in a Visual Basic programming class is presented with the following interface:



The objects have the captions and names indicated on the interface.

He is also presented with the table containing some data as shown below:

Name	Admission No.	Year of birth	Age
Kiptoo	1001	1985	
Odhiambo	1004	1986	
Wafula	1005	1984	
Khadija	1006	1982	

Required

(i) Write a code that will populate the ComboBox with the names on the table when the form is loaded. (4 marks)

(ii) Assume that the name of a student has been selected from the ComboBox.

Write the interface's code such that when the update command button is clicked, the program calculates the age of the selected person. The program then displays the admission number, year of birth and age on the respective labels as indicated on the interface. (10 marks)

(Total: 20 marks)

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QUESTION THREE

(a) Differentiate between the following terms as used in Visual Basic programming:

(i) Dynamic linking and static linking. (2 marks)

(ii) ActiveX control and data access object. (2 marks)

(b) Countries use different units to measure distance. You have been tasked to develop a program to convert distance input by a user in metres into either miles, yards, feet or nautical miles. The user selects from a ComboBox the unit to convert into. The program should contain two buttons: convert-distance and clear-controls. The program should then display the output on a label.

Required:

(i) Draw a well labelled user interface to depict the above description. Your controls should be labelled: cboUnits, txtDistanceValue, lblDistanceMeters, btnConvert and btnClear.

Choose appropriate captions for your controls. (6 marks)

(ii) On form load event, write code that could assign cboUnits the following values: Miles, Yards, Feet, Inches, and Nautical Miles. (2 marks)

(iii) In the button, btnClear, write code that will reset all the controls. (2 marks)

(iv) Using an appropriate control structure, write code on the btnConvert that would convert the distance entered from the unit selected into metres as per equivalences indicated in the table below:

Distance	Equivalent in meters
Miles	1609.34
Yards	0.9144
Feet	0.3048
Inches	0.0254
Nautical miles	1852

Ensure that your program validates the distance to accept numeric values.

(6 marks)
(Total: 20 marks)

QUESTION FOUR

(a) Outline four functions of an assembler. (4 marks)

(b) Enumerate four features of low level languages. (4 marks)

(c) Highlight four areas to consider in the problem definition stage of program development. (4 marks)

(d) A program is required that allows a user to enter the length and width of a rectangle. The program then computes the area and perimeter of the rectangle and displays the result.

Required:

(i) A pseudocode for the above program. (4 marks)

(ii) A flowchart for the above program. (4 marks)
(Total: 20 marks)

QUESTION FIVE

(a) (i) Citing two examples, describe fourth generation languages. (4 marks)

(ii) Differentiate between procedural and structured programming languages. (4 marks)

(b) Explain the following terminologies as used in program development:

(i) Unit testing. (2 marks)

(ii) Documentation. (2 marks)

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(c) Outline four rules used in naming variables in Visual Basic. (4 marks)

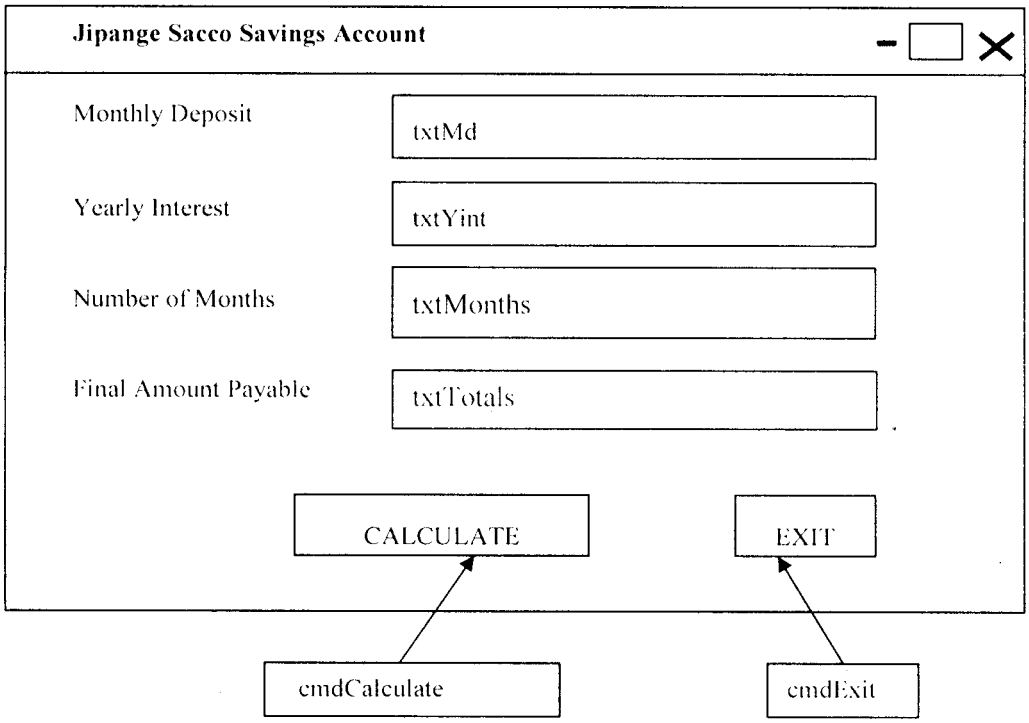
(d) Jipange Sacco has introduced a new product where customers save money in equal monthly instalments. The formula for calculating the final amount payable to a customer is given by:

$$F = D\{ (1 + I)^m - 1 \} / I$$

Where:

- F - Final amount
- D - Monthly deposit amount
- I - Monthly interest rate
- m - Number of months

Jipange Sacco has designed the form below to be used to calculate the final amount payable to a customer:



Required:

Code to calculate the final amount payable in line with the above form. (4 marks)

(Total: 20 marks)

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