higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

INTRODUCTION TO SYSTEM DEVELOPMENT

(Second paper)

NQF LEVEL 2

(10041022)

11 December 2020 (X-paper)
09:00–13:00

This question paper consists of 16 pages.

555Q2N2011

Copyright reserved

TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.

2. Read all the questions carefully.

3. Number the answers according to the numbering system used in this question paper.

INSTRUCTIONS TO STUDENTS AND LECTURERS

1. Students must be seated in the computer laboratory 30 minutes before the start of the examination to ensure that all computers have the appropriate programs.

2. The questions must be completed on computer by using MS Office 2003 or a later version and VB.NET 2005 or VB.NET Express or VB.NET 2008.

3. Students must ensure that they print their work immediately after they completed a question. Ensure that your EXAMINATION NUMBER is printed on all PRINTOUTS. No questions without a printed EXAMINATION NUMBER will be marked.

4. In the event of problems such as a power failure, computer breakdown or a printer breakdown, the invigilator will make the necessary arrangements to continue with the examination process once the problem has been resolved. Students will not be penalised for time lost under these circumstances.

5. All work on the computer should be saved at regular intervals to prevent loss of work. No additional time may be allowed for work lost due to not saving.

6. No student may print his/her work for another student or make a memory stick available to another student or access another student's work on the network. Any attempt to access any information from or transfer information to another student in whatever manner is a contravention of the examination rules and regulations and will be viewed in an extremely serious light.

7. All PRINTOUTS and screen prints done during the session must be handed in.

Copyright reserved

8. Ensure that your EXAMINATION NUMBER appears on all PRINTOUTS.

9. Students may not copy the source code from VB.NET to MS Word and then print it from the word processor.

10. Steps to print a VB.NET form or any other screen:

    10.1 Run the solution.

    10.2 Hold the ALT key down and press the Print Screen button. (This will copy the active screen.)

    10.3 Open MS Word and paste the form/screen in a new document.

    10.4 Add your EXAMINATION NUMBER to the top right-hand side of your page.

    10.5 Print the page.

11. You are allowed to use the help files in VB.NET.

12. The following files will appear on your hard drive in the folders:

    12.1 QUESTION 1
    … \Fix Computer Inventory

    IMAGE: Computer.png

    … \IMAGES

    12.2 QUESTION 2
    … \SwimmingClub

    12.3 QUESTION 3
    … \ ABS COMPS

    12.4 QUESTION 4
    … \DreamVacationCalculator

Copyright reserved

QUESTION 1

The following questions refer to the VB.NET program, *Fix Computer Inventory,* that has been saved on your computer.

A company called Fix-computer asked you to develop an application to compute the depreciation of their computers, computer components, office machinery, and company vehicle.

The program allows the user to select the inventory item and select depreciation mode.

When the user clicks the *Calculate Depreciation* button, the item's depreciation information is displayed in a label at the bottom of the program.

You are tasked to design the graphical user interface for the program.

NOTE: No code is required for this question. You are only required to create the graphical user interface.

Use FIGURE 1 below and the instructions that follow as a guide to help you complete the interface.

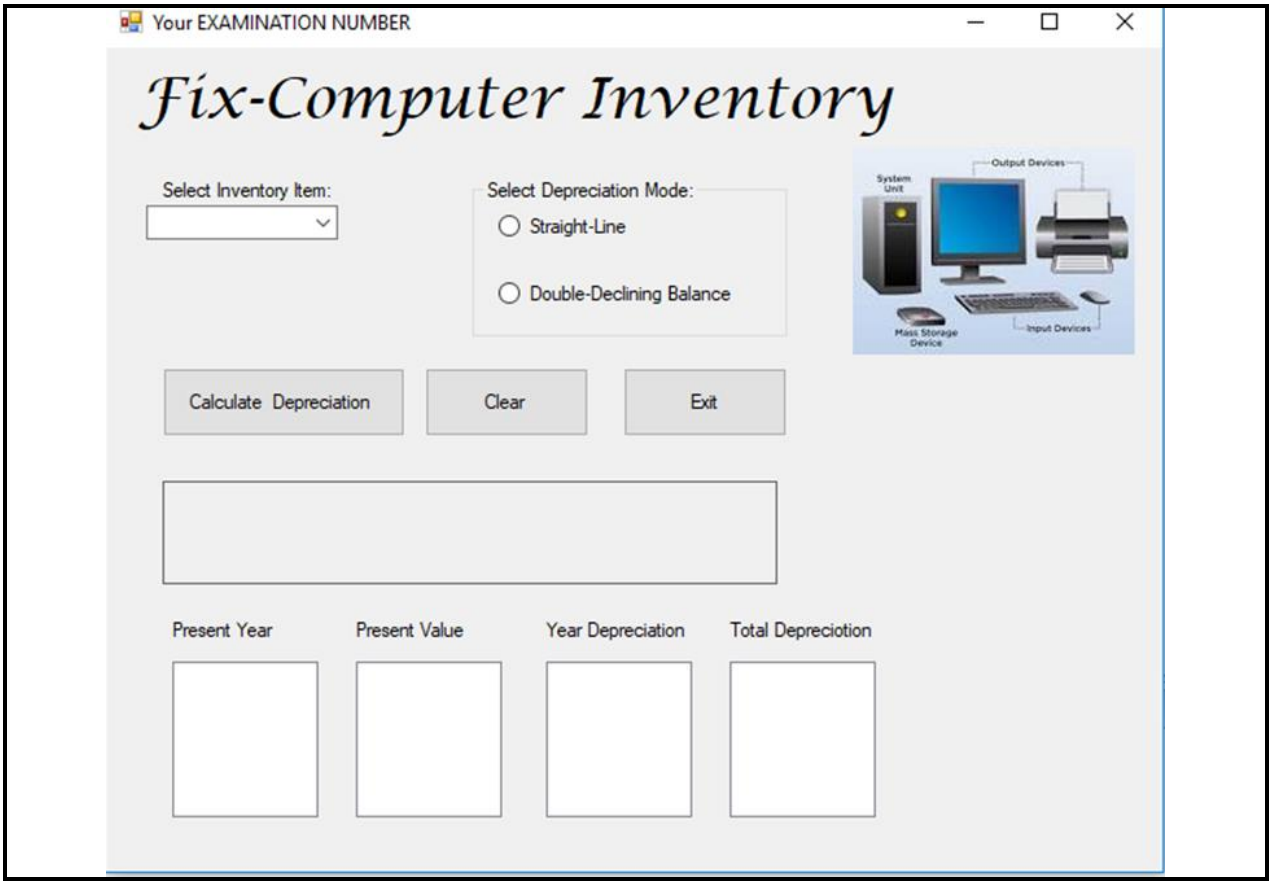


FIGURE 1

Copyright reserved

A blank interface has been saved on your computer. Open the program, *Fix Computer Inventory*, and follow the instructions below to complete the interface.

1.1 Add a picture box to the form as part of the heading:

CONTROL	NAME	IMAGE
PictureBox	picComputer	Use the image saved on your computer as *Computer.jpg*

(2)

1.2 Add ONE group box to the form, to group the *Lawyer Information, Client Details*, *Case Types* and *Payment Information*:

CONTROL	NAME	TEXT
Group Box	grpDepreciationMode	Select Depreciation Mode

(1)

1.3 Add SEVEN labels to the form, ONE for the Title, ONE for the select inventory item, select depreciation mode, FOUR for the information, FOUR list boxes and ONE to display the item depreciation information:

CONTROL	NAME	TEXT	SIZE	FONT
Label	lblTitle	Fix–Computer Inventory	26	Monotype Corsiva
Label	lblInventoryItem	Select Inventory Item	Default	
Label	lblYear	Present Year:	Default	
Label	lblValue	Present Value	Default	
Label	lblYearDepreciation	Year Depreciation	Default	
Label	lblTotal	Total Depreciation	Default	
Label	lblDisplay	(Blank)	**Border:** Fixed Single **Size:** See Figure 1	

(10)

1.4 Add FOUR list boxes to the form, to display present year, present value, year depreciation and total depreciation.

CONTROL	NAME	TEXT
Listbox	lstYear	(Blank)
Listbox	lstlstValue	(Blank)
Listbox	lstDepreciation	(Blank)
Listbox	lstTotal	(Blank)

(4)

Copyright reserved

1.5 Add TWO radio buttons to the form to indicate depreciation mode of the inventory item:

CONTROL	NAME	TEXT
Radio Button	radStrainght	Straight-Line
Radio Button	radDouble	Double-Declining Balance

(2)

1.6 Add a combo box to the form, to choose the rate:

CONTROL	NAME	ITEMS
Combo Box	cboInventoryItem	Select Inventory Item

(1)

1.7 Add THREE buttons to the form, ONE to process the payment, ONE to clear all the fields on the form, and ONE to exit the program:

CONTROL	NAME	TEXT	Font Size
Button	btnCalculateDepreciation	&Calculate Depreciation	Default
Button	btnClear	Cl&ear	Default
Button	btnExit	&Exit	Default

(3)

1.8 Change the text in the title of the form to your EXAMINATION NUMBER and make a PRINTOUT of the form. (1)

[24]

Copyright reserved

QUESTION 2

The following questions refer to the VB.NET program, *SwimmingClub*, that has been saved on your computer.

A local swimming complex requested you design a program that can help them to calculate admission fees for students that are members and none students or members accessing the complex facilities.

Clicking on the *Admission Fee* button should display the admission fee due for the student or member.

Use the IPO chart below to help you with the program:

INPUT	PROCESSING	OUTPUT
studentName Select status	Calculate admission fee • Student R12 • None Student R15 • Member R8 Determine status: AdmissionFee = Studentfee AdmissionFee = Studentfee - memberStatus Discount = admissionFee * 0.4) admissionFee = AdmissionFee – discount	AdmissionFee

FIGURE 2 below is a print screen of what the user interface looks like. The completed interface has been saved on your computer. Open the solution, *SwimmingClub*, and follow the instructions to complete the program:

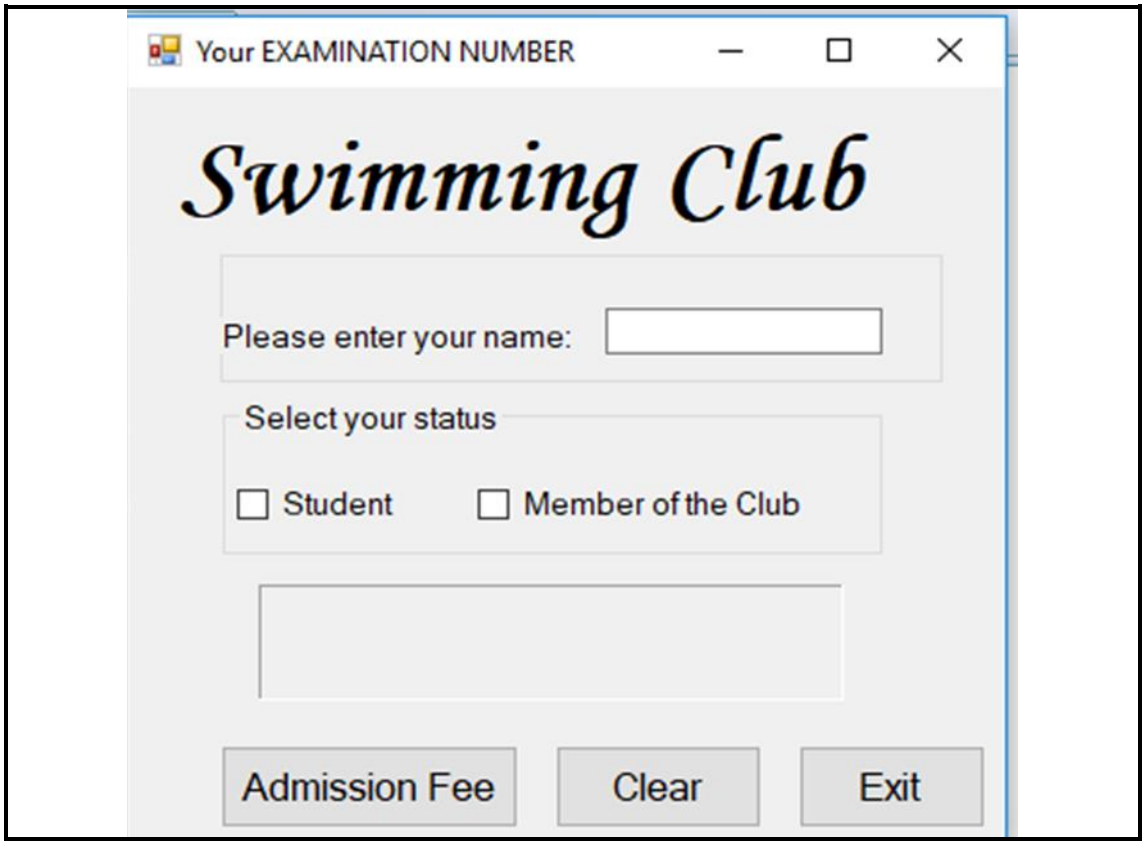
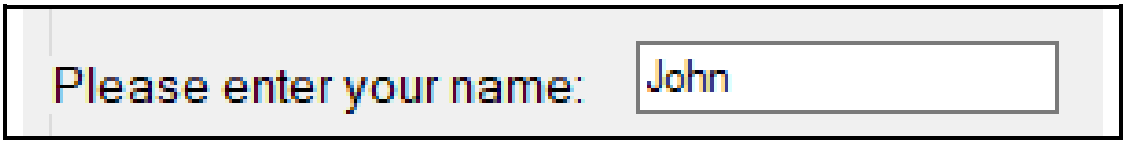


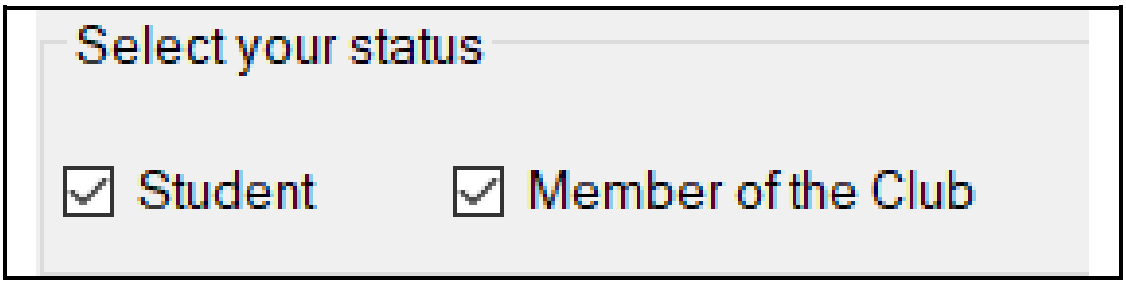
FIGURE 2

The following steps explain how to use the program to calculate the admission fee to access the swimming facilities:

STEP 1 RUN the program and enter the client's name*:*

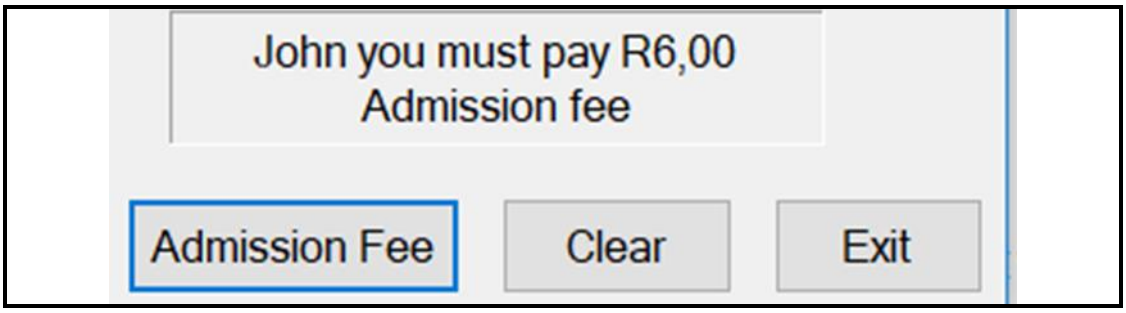


STEP 2 Select the applicable status check box button:



Copyright reserved

STEP 3 The admission fee is displayed as follows:



2.1 Add the following code to the form load event.

Add the following program code to the click event of the *Calculate Admission Fee* button:

2.1.1 Declare all the required variables. (3)

2.1.2 Convert and assign the value from the *name* text box to the appropriate variable. (2)

2.1.3 Determine the selected status of the student and if one of the statuses is selected, assign the appropriate amount using (an) <if> statement(s). (4)

2.1.4 Determine the selected status of a member and give a discount amount using (an) <if> statement(s). (4)

2.1.5 Calculate the admission fee. (3)

2.1.6 Display the calculated admission fee in the label as shown in Step 3 above. (4)

2.2 Clicking the *Clear* button should clear the textbox, the label and position the cursor in the name textbox. (3)

2.3 Clicking the *Exit* button should close the program. (1)

Make a PRINTOUT of the source code.

[24]

QUESTION 3

The following questions refer to the VB.NET program, *ABS COMPS*, that has been saved on your computer.

Use the IPO chart below to help you with the program:

Your friend asked you to develop an application to help him calculate selling price, total income and profit with a mark-up of 10% for every product he sells.

The program allows the user to enter a product name, number of units and cost price of the product as follows:

INPUT	PROCESSING	OUTPUT
Productname NoUnits CostPrice	***Calculations*** MarkUp = 10% x CostPrice SellingPrice = CostPrice + MarkUp TotalIncome = NoUnits x sellingPrice Profit= MarkUp + Selling + TotalIncome	MarkUp SellingPrice TotalIncome Profit

FIGURE 2 below is a print screen of what the user interface looks like. The completed interface has been saved on your computer. Open the solution, *ABS COMPS*, and follow the instructions to complete the program:

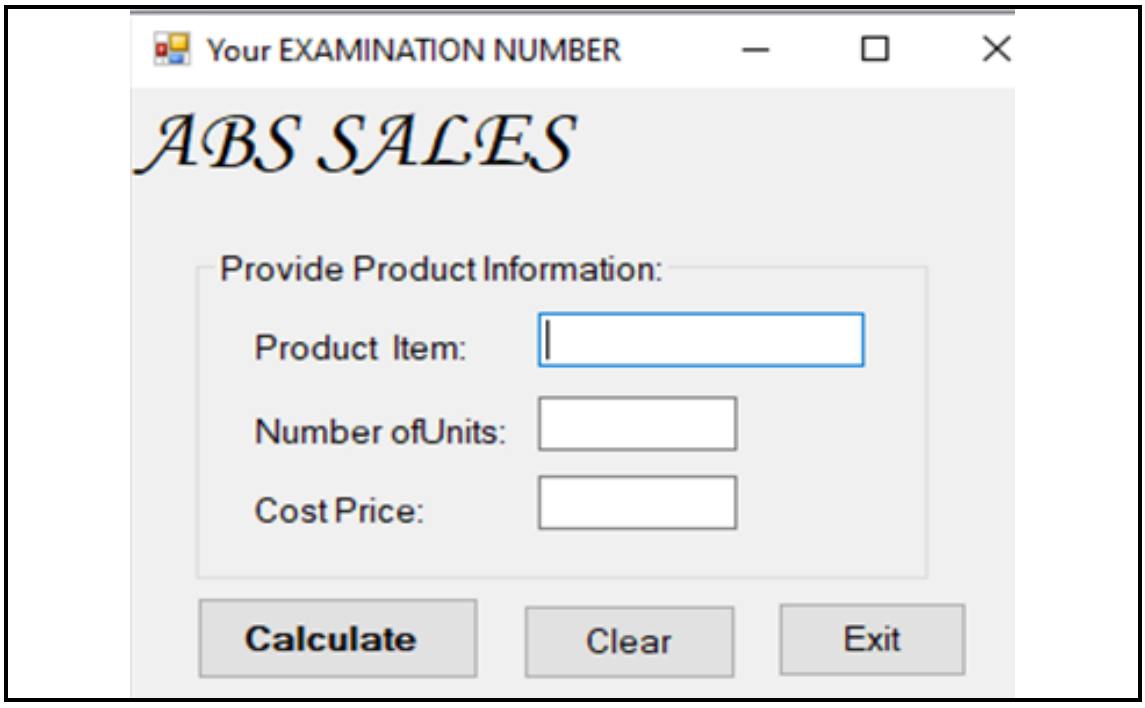
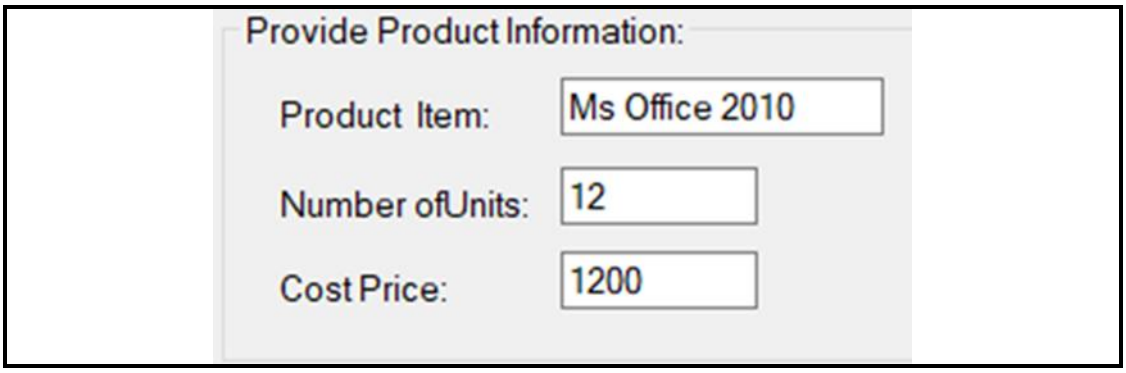


FIGURE 2

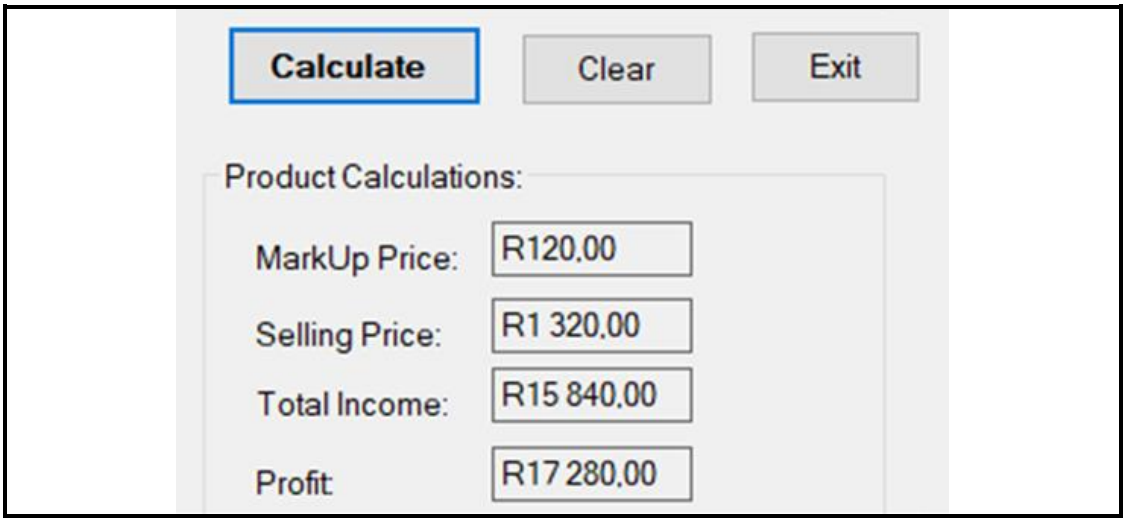
Copyright reserved

The following steps explain how to use the program to determine day of the week/weekend.

STEP 1 RUN the program and enter product information:



STEP 2 Click the *Calculate* button and display the calculation as follows in the labels:



3.1 Add the following program code to the click event of the *Determine Day* button:

3.1.1 Declare all the required variables. (6)

3.1.2 Determine that the product name text box is not empty. If it is empty, alert the user with a message box and set focus. Use (an) <if> statement(s)

Convert and assign the value from the *name* text box to the appropriate variable. (5)

3.1.3 Determine that the number of units and cost price text boxes contain numeric values. If not, alert the user with a message box and set focus. Use (an) <if> statement(s). (4)

3.1.4 Calculate the mark-up price. (2)

Copyright reserved

3.1.5 Calculate the selling price. (2)

3.1.6 Calculate the total income. (2)

3.1.7 Calculate the profit. (3)

3.1.8 Display the calculated amounts in the labels as shown in Step 2 above. (4)

3.2 Clicking the *Clear* button should clear the textbox, the label and position the cursor in the textbox. (2)

3.3 Clicking the *Exit* button should close the program. (1)

3.4 Make a PRINTOUT of the source code. (1)

[32]

QUESTION 4

The following questions refer to the VB.NET program, *DreamVacationCalculator*, that has been saved on your computer.

Game Lodge asks you to design a program that will help their clients calculate the total cost for their vacation at their premises.

The program should accept the number of days and the size of group: the accommodation per person is R80, transport per person R10 and extra levy of 15% on the total cost of the group, if the group is greater than 6.

The calculations are as follows:

AccommodationCost = (NumberofDay x AccommodationperPerson) x sizeGroup

TransportCost = (NumberofDay x AccommodationperPerson) x sizeGroup

TotalCost = accommodationCost + TransportCost

Levy = TotalCost x 15%

TotalDue = TotalCost + Levy

FIGURE 3 below is a print screen of what the user interface looks like:

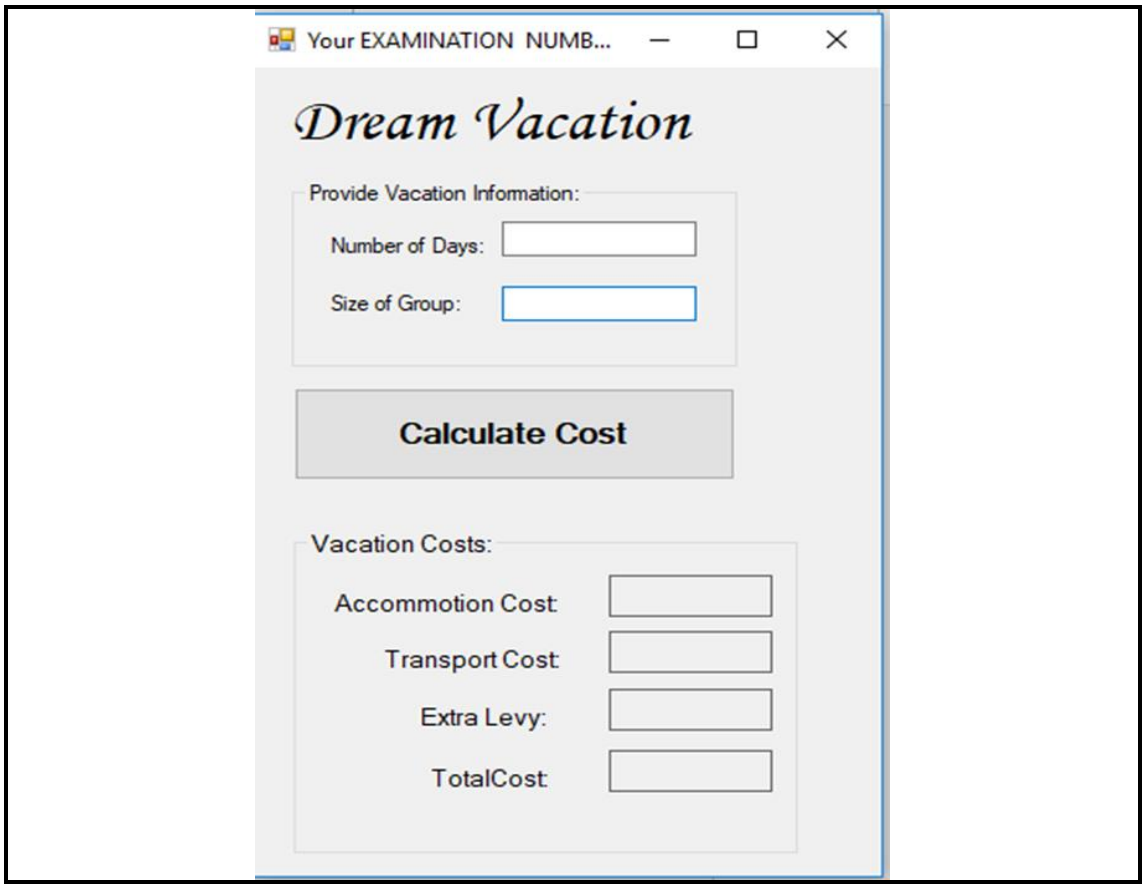
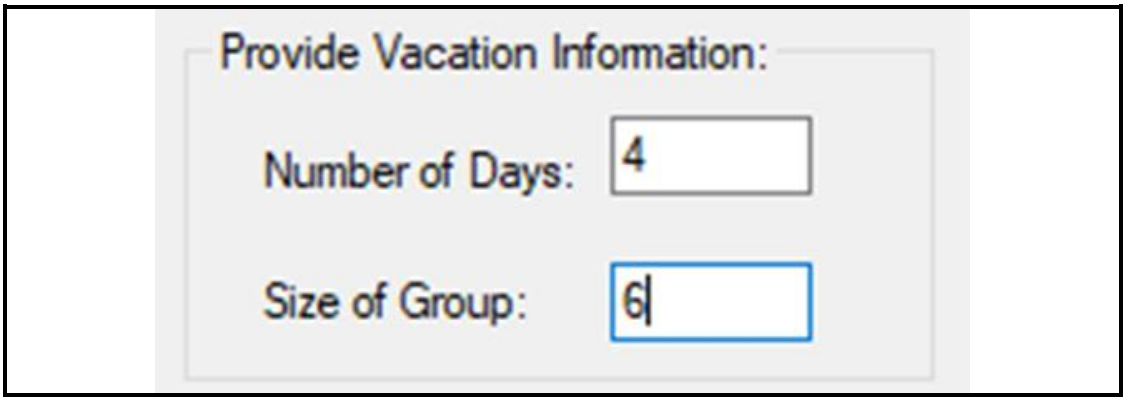


FIGURE 3

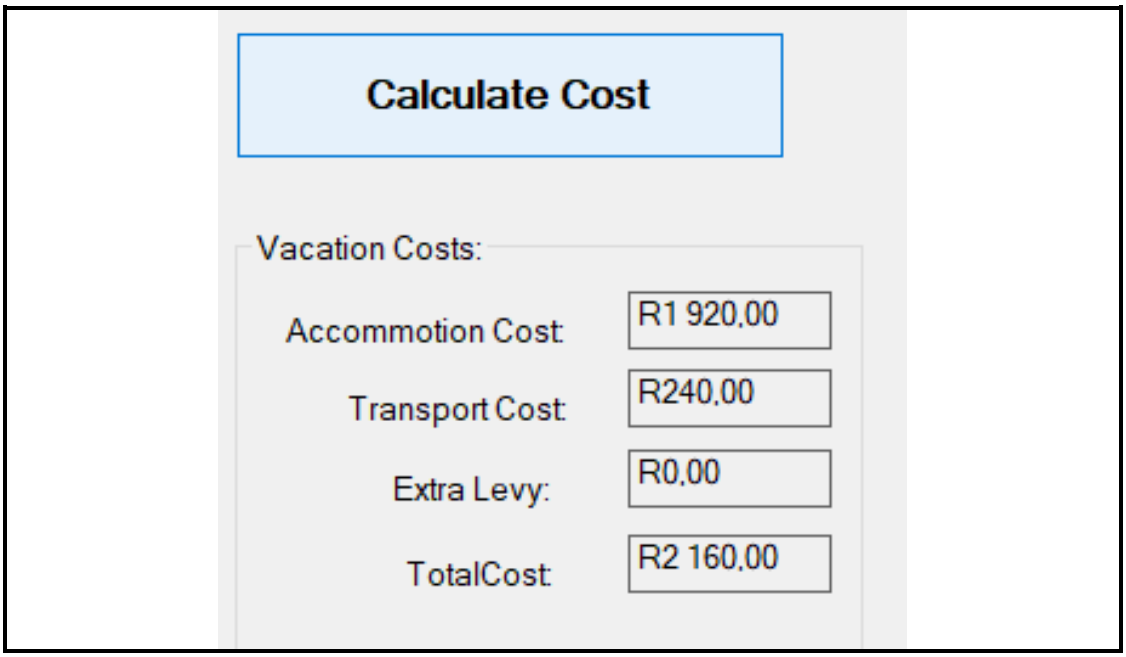
The following steps explain how to use the program:

STEP 1 RUN the program and enter the number of days and size of the group:

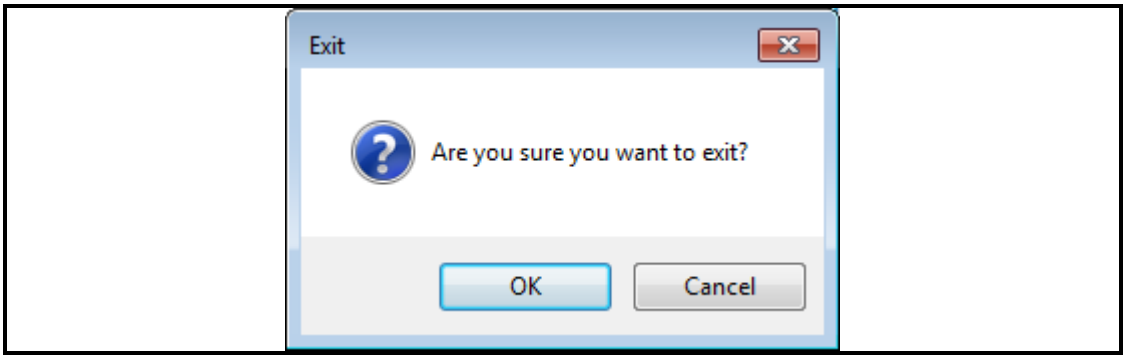


Copyright reserved

STEP 2 Click on the *Calculate Cost* button to display the output of the program in the display labels:



STEP 3 When the *Exit* button is clicked, the following message is displayed:



Clicking the *OK* button closes the application, while clicking the *Cancel* button leaves the program running.

The application has already been designed and coded, but it contains numerous syntax and logical errors, and you have been tasked with debugging the source code.

Copyright reserved

Below is a PRINTOUT of the program code with all the syntax and logical errors still present:

```
Public Class Form1
    'Declare global variables
    Dim intNoDays As Integer
    Dim intSizeGroup As Integer
    ConstT decAccommodationpp As Decimal = 80.0
    Const DecTrasportCostpp As Decimal = 10.0
    Const decExtLevy As Decimal = 0.15

    Dim decAccommodationCost As Decimal
    Dim decTrasportCost As Decimal
    Dim decTotalCost As Decimal
    Dim decLevy As Decimal
    Dim decTotalDue As Decimal

Private Sub btnCalculate_Click(ByVal sender As System.Object,
ByVal e As System.EventArgs) Handles btnCalculate.Click
        'Assign values of textbox to variables
        intNoDays = txtNofDay.Text
        intSizeGroup = txtSizeGroup.Text
        'calculate accommodation cost
        decAccommodationCost =
        'calculate transport cost
        decTrasportCost =
        'calculate totalcost
        decTotalCost = decAccommodationCost + decTrasportCost
        'determine size of group greater than  six
        If intSizeGroup = 6 Then
            'calculate extra levy charge
            decLevy =
        End If
        'calcculate totaldue for the vacation including levy

        'display accommodation cost, transport cost, levy cost and
totaldue
        lblDisplayAccommodationCost.Size =
decAccommodationCost.ToString("c2")

        lblDisplayTransCost.Text = decTrasportCost.ToString("c2")

        lblDisplayLevy.Text = decLevy.ToString("c2")
        lblDisplayTotalCost.Text = decTotalDue.ToString("c2")

        clearContent()
    End Sub
    Sub clearContent()
        txtNofDay.Text = ""
        txtNofDay.Focus()
        txtSizeGroup.Text = ("")
    End Sub

    Private Sub btnExit_Click(ByVal sender As System.Object, ByVal
e As System.EventArgs) Handles btnExit.Click
        Exit program
        Dim intAnswer As Integer
        Answer = MessageBox.Show("Are you sure you want to exit?",
"Exit", MessageBoxButtons.OKCancel, MessageBoxIcon.Question)
        If intAnswer = vbYes Then

        End If

    End class
```

Copyright reserved

4.1 The completed program has been saved on your computer, but the program is not functioning properly.

Open the program, *DreamVacationCalculator*, and correct all the syntax and logical errors in the code. (18)

4.2 Add your EXAMINATION NUMBER to the source code as indicated and make a PRINTOUT of the source code. (1)

4.3 Add your EXAMINATION NUMBER to the title bar of the form, and then use the program to compare the following two guests:

	VACATION 1	**VACATION 2**
Number of Days	4	5
Size of Group	6	7

Make a PRINTOUT of the form showing the correct result. (1)

[20]

TOTAL: 100

Copyright reserved