kasneb

DICT LEVEL II

PROGRAMMING CONCEPTS

TUESDAY: 22 May 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)   Parameters in Visual Basic could be passed "by value" or "by reference".

        Explain the meaning of the above statement.   (4 marks)

(b)   Distinguish between each of the following pairs of functions as used in Visual Basic:

        (i)   "CSng" and "CStr".   (2 marks)

        (ii)   "Str" and "Val".   (2 marks)

(c)   Write the expected output from the following Visual Basic procedure:

```
Sub Remarks
Private  Sub  cmd1_Click ( )
        print    INT (6.1)
        print    INT (-6.1)
        print    INT (-6.8)
        print    INT (2.34567 * 100 + 0.5)/100
End Sub
```

        (4 marks)

(d)   Study the Visual Basic program shown below:

```
Dim  m   As Integer
        m = Val (txtmarks.Text)
        if  m > = 0  and m < 101 Then
        if  m > 69  Then
                txtRemarks.Text = "A"
        else if  m > 59 then
          txtRemarks.Text = "B"
        else if  m > 49 Then
          txtRemarks.Text = "C"
        else if  m > 39 Then
          txtRemarks.Text = "D"
          else
          txtRemarks.Text = "FAIL"
        EndIF
        else
          txtRemarks.Text = "Invalid Entry"
        EndIF
EndSub
```

Required:

Rewrite the program above using Case Selection so as to output the same results.
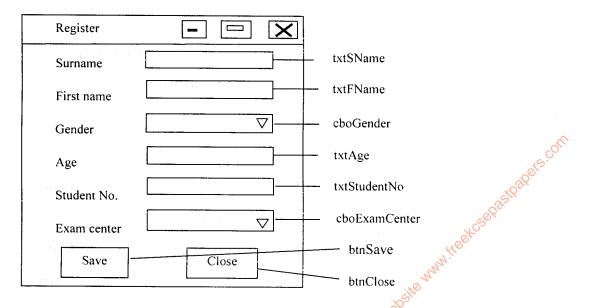
Name your program "cmdRemarks". (6 marks)

(e) Explain two objectives of code optimisation in Visual Basic. (2 marks)

(Total: 20 marks)

QUESTION TWO

You have been tasked to develop a students' registration system whose graphical user interface is shown below:

Required:

(a) Write a Visual Basic code to populate cboGender and cboExamCenter with the following content:

cboGender	Male Female
cboExamCentre	001 002 003

(5 marks)

(b) Write a Visual Basic code to validate txtStudentNo such that the field will not accept blanks. (3 marks)

(c) Using a simple IF.....Then control structure and message pop up, write a Visual Basic code that would validate txtAge as a number. (5 marks)

(d) Draw a flow chart for the problem described in this question.

Consider specifications stated in (a), (b) and (c) above. (7 marks)

(Total: 20 marks)

QUESTION THREE

(a) (i) Highlight four reasons why you would follow a coding convention when writing your programs in Visual Basic. (4 marks)

(ii) Write a Visual Basic procedure named "activateButton" to disable the button "cmdStatus" when the user clicks on a check box, otherwise the button should be enabled. (4 marks)

(b) Distinguish between "standard" and "class" modules as used in Visual Basic. (4 marks)

(c)   The graphical user interface below is to be used by Tujenge Company Ltd. to process its payroll:

```
┌─────────────────────────────────────────────────────────────────────┐
│  TUJENGE PAYROLL SYSTEM                              [ - ] [ ▭ ] [ X ]│
├─────────────────────────────────────────────────────────────────────┤
│                                                                       │
│   Rate Per Hour   [ txtRate    ]    Days Worked    [ txtDays    ]     │
│                                                                       │
│   Hours Worked    [ txtHours   ]    Gross Pay      [ txtGpay    ]     │
│                                                                       │
│   NHIF            [ txtNhif    ]    PAYE           [ txtPaye    ]     │
│                                                                       │
│   NSSF            [ txtNssf    ]    Total Deductions[ txtDeduct  ]    │
│                                                                       │
│   Net Pay         [ txtNet     ]         [ CALCULATE ]               │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
                                                       btnCalculate
```

Additional information:

- Gross Pay   =   Rate per hour * hours worked *days worked
- NHIF   =   1% of Gross Pay
- NSSF   =   2% of Gross Pay
- PAYE   =   20% of Gross Pay
- Total deductions =   NHIF + NSSF + PAYE
- Net pay   =   Gross Pay - Total Deductions

Required:
Write a Visual Basic program to compute the gross pay and net pay given rate per hour, days worked and hours worked.   (8 marks)
                                                               (Total: 20 marks)

QUESTION FOUR
(a)   Contrast the following methods as used in Visual Basic programming:

(i)   Close ( ) and Hide ( ).   (4 marks)

(ii)   Opacity and Backcolour.   (4 marks)

(b)   You have developed and deployed a piece of software. However, you realise that the software contains some errors.

Required:
(i)   Explain two possible types of errors in your software.   (4 marks)

(ii)   State two ways in which the errors described in (b)(i) above could be avoided.   (2 marks)

(c)   Consider the user interface below:

```
┌─────────────────────────────────────────────────────────┐
│          Employee Details        ┌─┐  ┌─┐   ┌─┐          │
│                                  │─│  │□│   │✕│          │
│                                  └─┘  └─┘   └─┘          │
│  Employee No.    ┌──────────────┐                        │
│                  │              │                        │
│                  └──────────────┘                        │
│                                                          │
│  First Name      ┌──────────────┐                        │
│                  │              │                        │
│                  └──────────────┘                        │
│                                                          │
│  Surname         ┌──────────────┐                        │
│                  │              │                        │
│                  └──────────────┘                        │
│                                                          │
│  Marital Status  ┌──────────┬─┐                          │
│                  │          │▽│                          │
│                  └──────────┴─┘                          │
│                                                          │
│  Date of Birth ┌────────┬─┐ ┌────────┬─┐ ┌────────┬─┐   │
│                │        │▽│ │        │▽│ │        │▽│   │
│                └────────┴─┘ └────────┴─┘ └────────┴─┘   │
└─────────────────────────────────────────────────────────┘
```

The date of birth field consists of three combo boxes; day, month and year of birth of the employee.

Required:
Write a Visual Basic code that allows the user to enter the date of birth of the employee consisting of day, date and year.

(6 marks)
(Total: 20 marks)

QUESTION FIVE
(a)   Define each of the following programming terms:

      (i)   Object code.

(1 mark)

      (ii)   Source code.

(1 mark)

(b)   Outline four features of a good programming language.

(4 marks)

(c)   Explain three differences between "functional programming" and "object oriented programming".

(6 marks)

(d)   Write VB code that would define two arrays named 'col' and 'row'. Assign numbers 1-9 to each array, then display a multiple of the numbers as shown in the table below. Use the DO-WHILE loop. The table is displayed using a label named lblMulti.

1	2	3	4	5	6	7	8	9
2	4	6	8	10	12	14	16	18
3	6	9	12	15	18	21	24	27
4	8	12	16	20	24	28	32	36
5	10	15	20	25	30	35	40	45
6	12	18	24	30	36	42	48	54
7	14	21	27	35	42	49	56	63
8	16	24	32	40	48	56	64	72
9	18	27	36	45	54	63	72	81

(8 marks)
(Total: 20 marks)

....