MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

CITY CAMPUS - EVENING

CIT 111: FUNDAMENTALS OF PROGRAMMING

Date: 6th March, 2018   Time: 5.30 - 8.30pm

INSTRUCTIONS:

- Answer ALL Questions in Section A and any other TWO in Section B
- Use a new page for every question attempted and indicate number on the space provided on the page of the answer sheet
- Fasten together all loose answer sheets used
- No mobile phones in the examination room

Question one (30 marks)

a) Explain the meaning of the following terms using appropriate example as applied in Pascal
programming   **(10 marks)**

    i)   A constant

    ii) Real

    iii) Global variable

    iv) Append

    v) Argument

b) Identify eight invalid identifiers from the list below and explain why each is invalid   **(4 marks)**

1)	MasenoUniversity	8)	PROGRAM
2)	Repeat	9)	Program2
3)	$Lesson5	10)	Do_While
4)	Unit_2	11)	Procedure
5)	8_store	12)	Mean.Marks
6)	Mean-score	13)	End month
7)	Repeat_Until	14)	Paul

c) Write a Pascal program that compute the sum of integer numbers divisible by 9 between 1 and
10000 using For...Do loop then displays the result on the screen   **(6 marks)**

d) Study the program below and identify the errors then rewrite it correctly   **(4 marks)**

```
Program Displays
Const Price 25
Var
Quantity  integer
totalCost ;
Begin
  Writeln(Enter quantity :);
  Readln(quantity);
 Total cost = quantity*Price;
  Writeln('Total cost = ' totalCost);
End
```

e) Write down the output that will be printed on the screen by the following program when it is executed with values of 2 and 10 entered from the keyboard. **(3 marks)**

```pascal
Program tables;

Const

TableOf = 5;

Var

num1, num2, i : Integer;

{ This function multiplies two integer numbers and returns their product.}

Function ProductOf (num1,num2: Integer) : Integer;

Begin

ProductOf := num1 * num2;

End; {Function ProductOf}

Begin

        Writeln ('Table of : ',TableOf);

        Write ('Enter start of table:'); {Prompt & input start}

         Readln (num1);

        Write ('Enter end of table:'); {Prompt & input end}

        Readln (num2);

Writeln('Below is a display of table of : ',TableOf);

FOR i := num1 TO num2 DO {Use a loop to print out the table}

        Begin

        Writeln (i,' x ',TableOf,' = ',ProductOf(i,TableOf));

End;

Writeln('End of successful computation of table of : ',TableOf);

Writeln('***********************************************');

End.
```

f) Rewrite the following program using Repeat…Until loop   (3 marks)

```
Program DivisibleBy5;
Var
Num : Integer;
Begin
        For num := 1 To 2000 Do
    Begin
            If(num MOD 5 = 0) Then
            Begin
                Writeln(num, ' is divisible by 5');
            End;
    End;
End.
```

SECTION B: ANSWER ANY TWO QUESTIONS

Question Two (20 marks)

a) Explain the importance of text file in programming   (2 marks)

b) State and briefly explain three modes that can be used to open a text file   (6 marks)

c) Define the term file variable   (2 Marks)

d) Write a Pascal program that will retrieve registration number, name, gender and course of all students from a text file called 'C:\StudentRegistration.TXT' and display the information on the screen. The program should print the message 'Information retrieval completed' when the entire contents of the file has been read.   (10 marks)

Question Three (20 marks)

a) Distinguish between single dimensional array and two dimensional array using examples of how each is declared in a Pascal program.   (2 marks)

b) Write a code segment that will create a two dimensional array called Names with 15 rows and 25 columns of string type, then assign a value in row 9 and column 15   (2 marks)

c) Declare a record called Employee that has the following fields: identityNo, name, rank of type String, and salary of type Real   (4 marks)

d) Write a code segment that will create an instance of Employee and assign values to the fields of the instance   (4 marks)

e) Write a program segment that will declare an array of Employee named EmployeeRecord that can contain records of 50 employees, then assign a record values to index 20 of the declared array.   (4 marks)

f) Use FOR...DO loop to write a Pascal program that will compute the squares of integer numbers between 1 to 50 and store them in an array.   (4 marks)

Question Four (20 marks)

a) Distinguish between the following as applied in Pascal programming using appropriate examples
   i) A procedure and a function   (4 marks)
   ii) Parameter and argument   (4 marks)

b) Explain two methods that can be used to pass parameter values during the function call. **(2 marks)**

c) Write a Pascal program that uses a function called ComputeVolume. The function receives the values of length, width, and height of type Real, the compute the volume and returns a Real value. The function is called by values received from the keyboard. The program should display the value of the computed volume on the screen.   (10 marks)

Question Five (20 marks)

a) An institution of higher learning wishes to develop a program to capture CAT marks and Examination marks from the keyboard. The program is to compute the sum of CAT marks and Examination marks then evaluate the grade based on the total marks. The program will only accept the CAT marks if it is less than or equal to 30, and Examination marks if it is less than or equal to 70. If the CAT marks is out of range then the system prompts the user to enter the marks between 0 to 30, and if the Examination marks is out of range then the system prompts the user to enter the marks between 0 to 70. Upon successful evaluation of the grade, the program will display the total marks and the equivalent grade on the screen. If the grading is to be evaluated based on the following criteria:

b)

Marks	Grade
70 to 100	A
60 to 69	B
50 to 59	C
40 to 49	D
0 to 39	F

i) Draw a flowchart to represent the above program (6 marks)
ii) Write a pseudocode representation of the above program (6 marks)
iii) Write a Pascal program implementation of the above system (8 marks)