JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

DEPARTMENT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE (ACTUARIAL SCIENCES WITH IT)

1ST YEAR 1ST SEMESTER 2018/2019 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: **SCS 103**

COURSE TITLE: **PROGRAMMING IN PASCAL**

EXAM VENUE: **STREAM: ACTUARIAL SCIENCE**

DATE: DECEMBER 2018 **EXAM SESSION:**

TIME: 2.00 HOURS

INSTRUCTIONS:

1. **Answer Question 1 (Compulsory) and ANY other two questions**
2. **Candidates are advised not to write on the question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE **[30 MARKS]**

(a) Define the following terms and concepts as applies to computer programming. [8 Marks]
   (i) Compiler
   (ii) Source Code
   (iii) Programming language
   (iv) Algorithm

(b) Explain why it is recommended to include comments while writing Pascal programs. [2 Marks]

(c) Explain the three main sections in a Pascal program structure. [6 Marks]

(d) Use an example to demonstrate how the following are implemented in Pascal Code. [8 Marks]
   (i) Modulus
   (ii) Constant declaration
   (iii) Expressing logical operators
   (iv) Number of decimal places in the output

(e) Given that the reactance (Xc) of a capacitor equals 1/(2PIfC), where f is the frequency in hertz, C is the capacitance in farads, and PI is 3.142, write a program that displays the reactance of ten successive capacitor's for the frequency range 10 to 100 Herts in 5hz steps. [6 Marks]

QUESTION TWO **[20 MARKS]**

(a) Using the same example for demonstration, differentiate between pseudo-code and flowchart. [4 Marks]

(b) Outline the major steps involved in developing a suitable computer program. [8 Marks]

(c) Define the following terms and concepts as applies to Pascal programming. In each case, include an example on how they are implemented in Pascal programming code. [8 Marks]
   (i) Arrays
   (ii) Records
   (iii) Procedures
   (iv) Pointers

QUESTION THREE **[20 MARKS]**

(a) Using correct flowchart, explain the decision-making structures as applies to Pascal programming. [4 Marks]

(b) Write a Pascal program that can be used to compute the root of a quadratic equation $y = mx + c$. [10 Marks]

(c) Write a Pascal program that can be used to print an output as show below. [6 Marks]

```
*
**
***
****
*****
******
*******
```

QUESTION FOUR **[20 MARKS]**

(a) Differentiate between *pre-test* and *post-test* looping structures as applies to Pascal programming. Use a flowchart in your answer. [4 Marks]

(b) Adopt an example of both pre-test and post-test Pascal code in implementing a program that computes the squares of the first 20 integers. [10 Marks]

(c) Write a Pascal program that can be used to computer the factorial of integer *n*. [6 Marks]

QUESTION FIVE **[20 MARKS]**

(a) Use a suitable example to demonstrate implementation of the following in Pascal: [12 Marks]
   (i) Subprogram
   (ii) Strings
   (iii) Packed Arrays
   (iv) Variant

(b) Write a Pascal program that can be used to accept three positive integer values, add them and calculate the square root of their sum. [8 Marks]

- END –