MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT 310: PROGRAMMING LANGUAGES

DATE: 15/4/2019 **TIME: 11.00-1.00 PM**

INSTRUCTIONS

Answer **question ONE and any other TWO questions.**

QUESTION ONE (COMPULSORY) (30 MARKS)

a) Define an algorithm as used in programming languages (2 marks)

b) Define the difference between **while** and **do while loop**. (4 marks)

c) Define a pointer. (2 marks)

d) AND, OR and NOT are logical operators. Mention the data type expected for their operands (2 marks)

e) Explain the difference between variables and constants. (4 marks)

f) Explain the different types of programming languages. (8 marks)

g) Given the following piece of code fragment, check the problem with the code (4 marks)

```
string name;
name = “John”; // line 2
switch(name)
{
        case “Smith”: cout << “smith”;
                        break;
        case “John”: cout <<”john”;
                        break;
}
```

h) Describe static binding (2 marks)

i) Java supports parametric polymorphism (generics). Write the name of another language that supports parametric polymorphism. (2 marks)

QUESTION TWO (20 MARKS)

a) Define an array. (2 marks)

b) Explain the different data types used in programming languages. (4 marks)

c) Among the following list of programming languages and develop environment:
Algol, C, C++, Java, C#, Fortran, LISP, Prolog, SIMULA, Scheme, Basic, COBOL, Eclipse, Perl, Ruby.

i. Name the earliest OO programming language (2 marks)

ii. Name the first higher level programming language. (2 marks)

iii. Name the first to use BNF to describe the grammar of the language. (2 marks)

iv. Name one which is an IDE. (2 marks)

d) Consider the following code fragment:

```
void someFunction();
int main()
{
        int a=5;
        int i=0;
    while(i<5)
    {
        int a = 4;
        cout << a; // line X
        i++;
    }
    cout << a; // line Y
    someFunction();
}
void someFunction()
{
    int a = 10
    cout << a; // line Z
```

}

i. Give the output of line X (2 marks)

ii. Give the output of line Y (2 marks)

iii. Give the output of line Z (2 marks)

QUESTION THREE (20 MARKS)

a) Mention the various objectives of principles of programming language. (6 marks)

b) Define a loop and give examples of various types of loops used in programming languages (6 marks)

c) Give an advantage of compilation over interpretation and an advantage of interpretation over compilation (4 marks)

d) Check the following code fragment and identify the line with a problem. (4 marks)

```
int main()
{
    int x=4, y=3; // line 1
    const int i = 10; // line2

    x = x + i; // line 3
    i = y*2; // line 4
}
```

QUESTION FOUR (20 MARKS)

a) Mention and give an example of the various Paradigms of Programming (8 marks)

b) Briefly explain the different types of translation and their roles (4 marks)

c) Describe the different types of errors that can occur in a program and Give one example of each. (8 marks)

QUESTION FIVE (20 MARKS)

a) Explain what you understand by the word Program. (2 marks)

b) Briefly explain the themes: (6 marks)

i. Imperative programming

ii. Functional programming

iii. Logic programming.

c) Give examples of object-oriented languages. (4 marks)

d) Describe a static variable and give an example how it is used in a program. (4 marks)

e) Give the advantages of hybrid implementation. (2 marks)

f) Java language support automated garbage collection. Give the name of another language that supports auto-mated garbage collection in its typical implementation. (2 marks)