



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)