Kasarani Campus
Off Thika Road
P. O. Box 49274, 00101
NAIROBI
Westlands Campus
Pamstech House
Woodvale Grove
Tel. 4442212
Fax: 4444175

KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS, 2020/2021 ACADEMIC YEAR
SECOND YEAR, SECOND SEMESTER EXAMINATION
FOR THE DEGREE OF BACHELOR OF SCIENCE
(COMPUTER SCIENCE)

KCS 208 - COMPUTER PROGRAMMING LANGUAGES

Date: 10th December, 2020
Time: 2.30pm – 4.30pm

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

a) Define the following terms.
   i) Language syntax
   ii) Language semantics
   iii) Machine level language
   iv) Assembly level language
   v) High level language (10 Marks)

b) Outline six reasons why studying concepts of programming languages is important. (6 Marks)

c) James, a newly recruited software developer was assigned a software system to develop for Reli Motors. Advise him on the criteria he can employ to decide the programming language to use for the software development. (8 Marks)

d) Describe the following programming language design trade-offs.
   i) Reliability vs. cost of execution
   ii) Readability vs. writability
   iii) Writability (flexibility) vs. reliability (6 Marks)

QUESTION TWO (20 MARKS)

a) Give three reasons why there is need to Separate Lexical and Syntax Analysis in language implementation.

(8 Marks)

b) Variables can be characterized as a six-tuple of attributes. Explain these six attributes.

(12 Marks)

QUESTION THREE (20 MARKS)

a) What is a data type in a programming language?

(2 Marks)

b) Describe the typical operations that can be performed on a string data type.

(8 Marks)

c) By example show you can declare an array named Big_Numbers of size 20 which holds data if the type double.

(6 Marks)

d) Write a statement to initialize the above array with 4 values of your choice.

(4 Marks)

QUESTION FOUR (20 MARKS)

a) Briefly describe the following program flow control structures.

While ----- loop
Do ----------loop
For ----------loop
If ----------else (8 Marks)

b) Given the below C++ code, list the output of each and explain the difference in the usage of while…. and do….while loops.

i)
```
//While …..loop
    int i = 0;
    while (i < 5) {
      cout << i << "\n";
      i++;
    }
```

ii)
```
//do …while
    int i = 0;
    do {
      cout << i << "\n";
      i++;
    }
    while (i < 5);
```

(8 Marks)

c) Differentiate between program logic errors and syntax errors.

(4 Marks)

QUESTION FIVE (20 MARKS)

a) Describe the following data conversion types.

   i) Narrowing conversion

   ii) Widening conversion

(6 Marks)

b) Explain the six design issues for arithmetic expressions.

(12 Marks)

c) Define the term "operator overloading"

(2 Marks)