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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY  
UNIVERSITY EXAMINATIONS, 2020/2021 ACADEMIC YEAR  
THIRD YEAR, SECOND SEMESTER EXAMINATION  
FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY**

**KBI 2303 - SPECIALIZED PROGRAMMING LANGUAGES**

Date: 10<sup>th</sup> 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 ReliMotors. 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)