

MACHAKOS UNIVERSITY COLLEGE

UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPT OF COMPUTING AND INFORMATION TECHNOLOGY

**UNIVERSITY EXAMINATIONS FOR THE DEGREE OF
BACHELOR OF SCIENCE IN COMPUTER SCIENCE**

YEAR III SEMESTER I

COURSE CODE: SCO 306

COURSE TITLE: PROGRAMMING LANGUAGE

DATE: TIME: 2 HOURS

INSTRUCTIONS

- Answer Question ONE and any other TWO.

Question ONE: Compulsory

- a. List any TWO factors that influence on programming language design **[2 marks]**
- b. List any SIX conversions used by different data types in either “printf” or “scanf” functions in C programming **[3 marks]**
- c. Identify the five parts which make up a program written in either C or C++ programming language **[5 marks]**
- d. Define the following terms as used in programming **[4 marks]**
 - i. Data structure
 - ii. Control structure
- e. To manage the size of program code in many programming languages, control structures are mandatory. List and Explain the three control structures **[6 marks]**

Question TWO:

- a. List any FOUR programming Language Evaluation Criteria when choosing the language to use in program development **[4 marks]**
- b. List any SIX Primary Reasons for Good Programming Language Design **[6 marks]**
- c. Object-oriented programming is one of the programming language that is in wide used today. Explain the following terms as used in Object Oriented programming **[10 marks]**
 - i. Class
 - ii. Object
 - iii. Abstraction
 - iv. Encapsulation
 - v. Message passing

Question THREE:

- a. List and explain the TWO types of semantics in programming **[4 marks]**
- b. List and explain any FIVE Characteristics of a good programming language **[10 marks]**
- c. List and explain the three major classes to formal semantics as used in programming languages **[6 marks]**

Question FOUR:

- a. Discuss the following variations of formal semantics as applied in many programming languages **[8 marks]**
- i. Action semantics
 - ii. Predicate transformer semantics
 - iii. Algebraic semantics
 - iv. Concurrency semantics
- b. Explain the following types of data structures as its applied in many programming languages **[10 marks]**
- i. Array
 - ii. Union
 - iii. Graphs
 - iv. Structures
 - v. Set
- c. Differentiate Formal and Informal Semantics as used in programming languages **[2 marks]**

Question FIVE:

- a. List and explain any THREE parts that must be included when defining a function in C++ programming language **[8 marks]**
- b. List and Explain the TWO main kinds of operational semantics as used in Programming languages **[2 marks]**
- c. Using the C++ program code below draw the appropriate flow chart **[5 marks]**

```
#include <iostream.h>
int main ()
{
/* local variable definition */
int a = 100;

/* check the boolean condition */
```

```
if( a == 10 )
{
/* if condition is true then print the
following */
cout<<"Value of a is 10";
}
else if( a == 20 )
```

```
{
/* if else if condition is true */
cout<<"Value of a is 20";
}
else if( a == 30 )
{
/* if else if condition is true */
cout<<"Value of a is 30";
}
```

```
else
{
/* if none of the conditions is true */
cout<<"None of the values is matching";
}
cout<<"Exact value of a is: "<<a;
return 0;
}
```

- d. List any FIVE operators that are used by programming languages in program development **[5 marks]**