



# **MACHAKOS UNIVERSITY**

**University Examinations for 2019/2020 Academic Year**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY**

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR**

**BACHELOR OF SCIENCE (TELECOMMUNICATION AND INFORMATION  
TECHNOLOGY)**

**BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)**

**BACHELOR OF SCIENCE (APPLIED PHYSICS AND TECHNOLOGY)**

**BACHELOR OF SCIENCE (STATISTICS AND PROGRAMMING)**

**BACHELOR OF SCIENCE (ACTUARIAL SCIENCE)**

**BACHELOR OF SCIENCE (MATHEMATICS)**

**SMA 191: INTRODUCTION TO PROGRAMMING**

**DATE: 15/12/2020**

**TIME: 8:30 – 10:30 AM**

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## **INSTRUCTIONS**

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

### **QUESTION ONE (COMPULSORY) (30 MARKS)**

a) Define the following terms as used in Programming. (2 marks)

i. Program

ii. Programming Language

b) Interpret the following sample program line by line. (4 marks)

```
#include <stdio.h>
```

```
main()
```

```
{
```

```
    int *p, q;
```

```
    q = 100;          /* assign q 100 */
```

```
    p = &q;          /* assign p the address of q */
```

```
    printf("%d", *p); /* display q's value using pointer */
```

```
    return 0;
```

```
}
```

- c) Using an example explain operator and operand (4 marks)
- d) What is the difference between source code and Object code? (4 marks)
- e) Differentiate between a variable and a constant. (4 marks)
- f) C Language is Portable and efficient. Explain (4 marks)
- g) Suggest, with examples two ways in which constant values can be used in C expression statements. (4 marks)
- h) Use the following code to identify syntactical error. (4 marks)

**Code snippet**

```
<stdio.h>
#define PI 3.14
main()
{
    FLOAT radius, area
    printf("Enter the radius of the circle \n");
    scanf("%f", &radius);
    area = PI * radius * radius; /* PI is a symbolic constant */
    printf("Area is %f cm squared ",area);
    return 0;
}
```

**QUESTION TWO (20 MARKS)**

- a) A program is required that accepts the radius and height of a cylinder and computes the volume. Use a function to achieve this. (8 marks)
- b) Describe with examples, four relational operators. (4 marks)
- c) Using an example compare if—else and nested—if. (8 marks)

### QUESTION THREE (20 MARKS)

- a) Define the term function as used in programming. (2 marks)

*A program is required that accepts marks a student gets in four units and computes the average. Depending on the average the student is graded according to the table below.*

*70-100 =A*

*60-69=B*

*50-59=C*

*40-49=D*

*0-39=F*

- b) Write a C program to achieve the above task. (8 marks)
- c) What is an array? (2 marks)
- d) After writing a code your friend a programmer complained because the program was not readable. Using example discuss how you can address this problem. (4 marks)
- e) What is the difference between global and local variable? (4 marks)

### QUESTION FOUR (20 MARKS)

- a) During a task to develop a program you chose C language. Explain advantages of C as a programming language. (10 marks)
- b) You are required to write a program that displays the days of the month. Use array to achieve this. (6 marks)
- c) Distinguish between assembly language and Machine Language in programming. (4 marks)

### QUESTION FIVE (20 MARKS)

- a) Explain TWO Advantages of modular programming. (2 marks)
- b) Explain the reason functions are favored in programming. (8 marks)
- c) Write a program that will output the day of the week when a number is entered from the keyboard. (10 marks)