



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR DEGREE IN
BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONICS

EEE 102: PROGRAMMING I

DATE: 19/6/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Questions ONE and Any Other Two Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

a) Define the following terms (4 marks)

- i) Text editor
- ii) Compiler
- iii) Pseudocode
- iv) variable

b) Identify the programming errors in the program code below. (4 marks)

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

```
Main()
```

```
{
```

```
int , int n2, n3;
```

```
n = 5;
```

```
n2 = n * n
```

```
n3 = n2 * n2;
```

```
printf(“ n = %d, n squared = %d, n cubed = %d /n”, n, n2, n3);
```

```
return 0;
```

```
}
```

- c) Explain any six flowchart symbols. (6 marks)
- d) Describe the basic structure of a C program. (5 marks)
- e) Describe the steps involved in executing a C program. (5 marks)
- f) Write a C Program that will display all the even numbers from 0-20 using the **for... loop**. (5 marks)
- g) Describe the stepwise refinement process. (1 mark)

QUESTION TWO (20 MARKS)

- a) i) Write an algorithm that reads three numbers and prints the value of the largest number. (3 marks)
- b) i) Define an operator (1 mark)
ii) Explain any five operators used in C language. (5 marks)
- c) List and explain four fundamental data types supported by C compilers. (4 marks)
- d) i) Differentiate between a structure and an array. (2 marks)
ii) Write a student structure program in C programming language, that displays the name of a student and marks obtained. (5 marks)

QUESTION THREE (20 MARKS)

- a) Differentiate between the following giving an example in each (6 marks)
 - i) Declaration of variables
 - ii) Initialization of variables
 - iii) Escape sequences
- b) i) Describe two ways of initializing arrays. (2 marks)
ii) Using an array, write a C program that will accept marks obtained by 5 students in a specific subject. The program should then calculate the sum and the average of the student marks and display them. (5 marks)
- c) Describe how a structure variable is defined and how one can access members of a structure. (2 marks)
- d) State five rules that must be followed to have a valid identifier. (5 marks)

QUESTION FOUR (20 MARKS)

- a) i) What is a control structure? (1 mark)
ii) With the help of flow diagrams, describe three control structures supported in C. (6 marks)
- b) Name and describe three types of errors in C programs. (6 marks)
- c) i) Describe the syntax of a function. (2 marks)
ii) Write a function in C program code that will calculate and display the area of a triangle and the area of a rectangle. (5 marks)

QUESTION FIVE (20 MARKS)

- a) Write a C program that will accept 3 subject marks from a student and before calculating the average of the three subjects evaluate whether each mark is greater than or equal to 'zero' and less or equal to 'one hundred'. If not so an error message should be printed. If the marks meet the specified condition above then using the average it should calculate and display the grade using the following grading system. (5 marks)

Average	Grade
≥ 75	- Distinction
≥ 65	- Credit
≥ 40	- Pass
< 40	- Fail

- b) Briefly explain the steps involved in program development life cycle. (10 marks)
- c) Given the following declaration and initialization statements statements,

`int x = 4, y = 12, z = 3;`

`float u = 3.3;`

Evaluate the values of x for each of the following assignment expressions. (5 marks)

- `x += y % 2 ;`
- `x -= z % y ;`
- `x *= y + z * z ;`
- `x = z % u ;`
- `x %= y + z * z % y ;`