

**MACHAKOS UNIVERSITY COLLEGE**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**UNIT TITLE: COMPUTER PROGRAMMING**

**UNIT CODE: ESU 108**

**DATE: APRIL/MAY 2015**

**TIME 2 HRS**

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***Instructions: Answer question one and any other two questions***

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**Question 1 (30 Marks) - Compulsory**

a. Define the following terms

- i. Pseudo code [2marks]
- ii. Algorithms [2 marks]

b. The following is a simple c program [10 marks]

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

```
int main()  
{  
    /* my first program in C */  
    printf("Hello, World! \n");  
  
    return 0;  
}
```

Explain all the components of the code as follows

- i. #include <stdio.h>
  - ii. int main ()
  - iii. /\*my first program in c \*/
  - iv. printf("Hello, world!\n");
  - v. return 0;
- c. By use of examples, define the two types of comments used in C programming Language [4 marks]
- d. Write a C program which prompts the user to enter two integers and outputs their sum on the screen [6 marks]
- e. Differentiate between an editor and a compiler in c programming [6marks]

### **Question 2 (20 Marks)**

- a. Write a program to find the sum of first n natural numbers where n is entered by the user.  
Note: 1,2,3... are called natural numbers [8 marks]
- b. Show the syntax of the following control structures:
  - i. do...while [4 marks]
  - ii. if statement [4 marks]
- c. By use of code snippets, show the difference between the following c functions:  
printf() and scanf() [4 marks]

### **Question 3 (20 Marks)**

- a. Data types are important in C programming. Briefly discuss any four data types used in C. Give examples for each. [5 marks]
- b. List 4 main rules that are used while constructing variable names in C programming [4 marks]
- c. Write a computer program that prompts the user to enter two integer numbers and computes the sum [5 marks]
- d. Differentiate a local variable from a global variable as used in functions [2 Marks]
- e. Briefly discuss the following:
  - i. Low level programming languages.
  - ii. High level programming languages. [4 Marks]

### **Question 4 (20 Marks)**

- a. Define an array [2 marks]
- b. By use of an example, show how a 2-dimensional array is declared and initialized [4 marks]
- c. Write a C program that reads marks obtained by a student in a test of 100 marks and computes his grade according to the following criteria:  
Marks>=80 grade=A  
Marks>=70 & <80 grade=B  
Marks>=60 & <70 grade=C  
Marks>=50 & <60 grade=D  
otherwise grade=F [14 marks]

### **Question 5 (20 Marks)**

- a. While writing c programs, errors also known as bugs in the world of programming may occur unwillingly which may prevent the program to compile and run correctly as per the expectation of the programmer. Briefly explain three types of such errors and their causes. [6 marks]
- b. State and explain any six characteristics of programming languages. (6 marks)
- c. Give the main difference between unary and binary operators [2 marks]
- d. Write a C program that checks if a number is even (in the range 1-100) and only prints the number if it is even [6 Marks]