



KENYA METHODIST UNIVERSITY

END OF 2ND TRIMESTER 2018 (FT) EXAMINATIONS

SCHOOL : SCIENCE AND TECHNOLOGY
DEPARTMENT : COMPUTER SCIENCE
COURSE CODE : BIT 222 /CISY 111
COURSE TITLE : STRUCTURED PROGRAMMING
TIME : 2 HOURS

INSTRUCTIONS:

- *Answer Question One and any other Two Questions.*

Question 1 (One)

- a) Explain the following terms as used in programming
- i) Function (2 marks)
 - ii) Variable (2 marks)
 - iii) Algorithm (2 marks)
- b) State any five advantages of structured programming methodology. (5 marks)
- c) Differentiate between syntax and logical errors as used in programming. (4 marks)
- d) Explain the significance of structure charts as used in modular programming. (3 marks)
- e) Explain three control structures used to express program logic in C++ programming. (6 marks)
- f) Write a code segment in C++ that defines a function called Grade of type Integer and asks a user to enter a student score of an exam and finally outputs either "Pass" or "Fail" using the following condition. (5 marks)

Score	Output
< 50	Fail
50 and Above	Pass

- g) Prototype a function called addition that accepts two variables(a and b) of type integer and computes their sum whenever called at some point of the program (4 marks)

Question 2 (Two)

- a) Write a C++ program that defines a structure called Student with the member variables Sname of character data type, Maths, Eng, Kisw all of integer data type, total and Average both of float data type. Declare a variable S1 of type Student. Your program should prompt a user to input the student name, the three subject scores, and compute the total and average scores using the dot operator (.) to access the structure member variables. (9 marks)
- b) Most programming languages provide while, do while and for loop to handle looping requirements. Describe each of them using a flow diagram (6 marks)

Question 3 (Three)

- a) Explain a pointer variable as used in programming (2 marks)
- b) Explain each line in the following program segment (8 marks)

```
// my first pointer
#include <iostream>
using namespace std;

int main ()
{
    int value1 = 5, value2 = 15;
    int * mypointer;
    mypointer = &value1;
    *mypointer = 10;
    mypointer = &value2;
    *mypointer = 20;
    cout<< "value1==" << value1 << "/" value2==" << value2;
    return 0;
}
```

- c) What are the final values stored in the variables; value 1 and value 2 after execution of the above code? (2 marks)
- d) Explain the following functions as used in structured programming. (3 marks)
 - i) malloc()
 - ii) calloc()
 - iii) realloc()

Question 4 (Four)

- a) Explain a recursive function as used in program development (2 marks)
- b) Write a C++ recursive function to obtain the factorial of a number (n) entered by a user (5 marks)
- c) Using relevant examples distinguish between function argument pass by value and pass by reference (4 marks)
- d) Write a C++ code segment that defines a function called Add that returns the sum of two integers to the main function. The return type being an integer value (4 marks)