THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

MAIN EXAMINATION

SEPTEMBER –DECEMBER 2021

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

REGULAR PROGRAMME

DIT 004: INTRODUCTION TO PROGRAMMING METHODOLOGY

Date: DECEMBER 2021	Duration: 2 Hours
INSTRUCTIONS: Answer Question ONE and any TWO Questions	

Q1.

(a) Briefly describe the three broad classifications of programming languages

[6 Marks]

(b) Define the following terms.
  (i)   Computer program
  (ii)   Assembler
  (iii)   Compiler
  (iv)   Linker
  (v)   Debugger

[5 Marks]

(c) Giving an example of each, differentiate between pseudo code and flow chart.

[5 Marks]

(d) List 5 advantages of writing computer programs using high level programming languages.

[5 Marks]

(e) Write an algorithm that reads two values, determines the largest value and prints the largest value with an identifying message.

[5 Marks]

(f) Giving an example of each, differentiate between program logic errors and syntax errors.

[4 Marks]

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Q2.

List disadvantages of writing your programs using assembly level programming languages.

[10 Marks]

Citing an example, explain in detail the use of the following program control structures.

while loop

for loop

do….while loop

[10 Marks]

Q3.

Describe the divide and conquer problem solving technique.

[5 Marks]

(a)   List 5 variable naming conventions applied in C programming language.

[5 Marks]

(b)   Explain the pitfalls of writing a computer program without documenting within the program.

[3 Marks]

(c)   The following program contains several errors:
1.   /:: Now you should not forget your glasses:: /
2.   #inclusive <stdio.h>
3.   int main
4.   {
5.   printf("If this text"),
6.   printf(" appears on your display, ");
7.   printf("\n")
8.   printf('you can pat yourself on ' " the back!\n\n")
9.   return 0;
10.)

Quoting the line number, identify the errors and suggest the appropriate corrections.

[7 Marks]

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Q4.

(a) A program flow chart uses 5 basic symbols, name them and describe their use in a program flow chart diagrams.

[10 Marks]

(b) Draw a program flow chart for the problem of converting temperature in degrees centigrade to degrees Fahrenheit. Hint:

$$F = \frac{9}{5}° \, C + 32$$

[10 Marks]

Q5.

(a) Study the program code below:

```
1.  //Variable declaration and initialization
2.  #include <stdio.h>
3.
4.  int main() {
5.      int a, b,c;
6.      float f;
7.      a = 10;
8.      b = 20;
9.      c = a + b;
10.     printf("%d\n", c);
11.     f = 70.0/3.0;
12.     printf("f\n", f);
13.     return 0;
14. }
```

Explain what is happening or the role in each of the program lines 1, 2, 5, 6, 7, 9, 10 and 12. **[8 Marks]**

(b) Define the term "scope of a variable" and explain 3 places in a program where a variable can be declared. **[4 Marks]**

(c) Write a C program that displays the following output on the screen:

```
5
4
3
2
1
0
```
[8 Marks]

END

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