



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

JANUARY – APRIL 2015 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

REGULAR PROGRAMME

DIT 004: PROGRAMMING TECHNOLOGIES

Date: April 2015

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and ANY OTHER TWO Questions

- Q1. a) Distinguish between each of the following pair of terms
- i) Operator and operand
 - ii) Source code and object code **(4 marks)**
- b) Explain the meaning of the following terms:
- i) Pseudo code **(2 marks)**
 - ii) Compiler **(2 marks)**
 - iii) Algorithm **(2 marks)**
- c) What are keywords in a programming language? **(2 marks)**

- d) Sample the following code snippet and answer the questions that follow:

```
int n[5]={32,27,64,18,25};
int i;
printf(“%5%135s\n”, “Element”, “value”);
/*output contents in tabular format*/
For(i=0; i<10; i++)
{
Printf(“%7f%13d\n”,l,n[i])
}
```

- i) Write the output of the program. **(3 marks)**
- ii) What is the purpose of the literals -%s%13d\n in the program. **(1 mark)**
- e) Briefly describe difference between each of the following pairs of operators as used in a C language.
- i) /= and +=
- ii) == and !=
- iii) & and || **(6 marks)**
- f) Why is linking necessary in a C program? **(4 marks)**
- g) Describe the use of the printf() and scanf() methods in a C program. **(2 marks)**
- h) Explain the meaning of each of the following function prototypes.
- i) int f(int a);
- ii) void g(long a, short b); **(2 marks)**
- Q2. a) What is the difference between a variable and a pointer? **(3 marks)**
- b) Using appropriate iteration structure, write a program that will print even numbers between 1 and 20. **(7 marks)**
- c) Write a declaration of a character array and assign three initial values. **(3 marks)**
- d) Write a program that reads a text file (names.txt) containing the names of students information and prints the text on the screen. **(7 marks)**

- Q3. a) What is an array? **(2 marks)**
b) Draw a flow chart to illustrate the following program. **(4 marks)**

```
#include<stdio.h>
void main ()
{
int mark;
printf("\nEnter the mark:\n");
scanf("%d", mark);
if(mark<40)
printf("\n you have failed!\n");
else
printf("\n you have passed!\n");
}
```

- c) C language statements, labels, array, etc are separated by special characters known as delimiters. Enumerate the use of the following delimiters in C language construct. **(4 marks)**

- i) #
- ii) []
- iii) { }
- iv) ;

- d) Suppose a,b,c are integer variables that have been assigned the values a=8, b and c=-5. x, y, and z are floating point variables with values x=8.8, y=3.5, z=-0.5. Determine the value of each of the following expressions. **(8 marks)**

- i) $(x/y)+z$
- ii) $2*b+3*(a-c)$
- iii) $(a*c)\%b$
- iv) $x\%y$

- c) Write C program statement to allocate space for 5 integer elements and assign respective initial values. **(2 marks)**

Q4. a) Explain the following terms used in C programming language.

- i) Vocabulary
- ii) Syntax
- iii) Semantics

(6 marks)

- b) Rewrite the following program using the switch construct

```
#include<stdio.h>
main()
{
char grade;
printf("Enter the grade");
scanf("%c", &grade);
if (grade=='A');
printf("Excellent!\n");
else if (grade=='B')
printf("Good!\n");
else if (grade=='C')
printf("fair!\n");
else if (grade=='D');
printf("poor!\n");
else if (grade=='E');
printf("very poor!\n");
else
printf("wrong entry!Enter a grade in A.....E\n");
}
```

(4 marks)

- c) Write a declaration of a structure called account with account_number, first_name, last_name and balance as its fields. **(2 marks)**

- d) With the aid of a diagram, briefly illustrate the compilation process of a C program. **(5 marks)**

- e) Distinguish between the indirection operator (*) and the address operator (&) as used with pointers. **(2 marks)**

- Q5. a) What is a structure? **(2 marks)**
- b) What are format specifiers? Explain while giving examples their significance in a C program. **(5 marks)**
- c) Give the meaning of the following components of a C program.
- i) Preprocessor directive
 - ii) Declaration
 - iii) Comment
 - iv) Header file **(8 marks)**
- d) What is the output of the following program?
- ```
#include<stdio.h>
Main()
{
int pica=0, delta=0;
while (pica<=20)
{
If(pica%5==0)
{
delta+=pica;
printf("\n%d",delta);
}
delta++;
}
}
```
- (2 marks)**
- e) "C is a structured language". Briefly explain what you understand by this statement. **(2 marks)**
- f) What is a function? **(2 marks)**

**\*END\***