Name: _____ Index No_____/_____

1920/203
STRUCTURED PROGRAMMING
November 2015
Time: 3 hours

Candidate's Signature:_____

Date:_____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN INFORMATION TECHNOLOGY

MODULE II

STRUCTURED PROGRAMMING

3 hours

INSTRUCTIONS TO CANDIDATES:

*Write your **name** and **index number** in the spaces provided above.*
***Sign** and write the **date of examination** in the spaces provided above.*
*This paper consists of **TWO** sections; **A** and **B**.*
*Answer **ALL** the questions in **section A** on the spaces provided on the question paper.*
*Answer **any FOUR** of the **FIVE** questions in **section B** on the spaces provided on the question paper.*
Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum score	Candidate's scores
A	1-10	40	
B	11	15	
	12	15	
	13	15	
	14	15	
	15	15	
Total Score			

This paper consists of 12 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Section A: (40 marks)
*Answer **ALL** the questions*

1. Outline the functions of each of the following syntactic symbols as used in C programming language.

(a) , (1 mark)

(b) [] (1 mark)

(c) {} (1 mark)

(d) ; (1 mark)

2. James developed a program using structured programming approach. Outline **four** characteristics that could be present in the program. (4 marks)

3. Mary intends to develop a program using a C programing language. Outline **four** steps that she would go through. (4 marks)

4. (a) Write **two** examples in each case that would be used to create a simple student registration program in C programming language:

(i) Keywords; (1 mark)

(ii) Identifier. (1 mark)

(b) The following is an extract of a C program written by students during a programming lesson.

```
#include<stdio.h>
void main()
{
integer:i,j;
float: mean;
printf("Input two values \n");
fscanf("%d",&i, &j);
mean=(i+j)/2;
prinf(" The mean %d \n",mean);
}
```

Rewrite the program by removing the errors in the code. (2 marks)

5. Outline **four** functions of a compiler in a C program. (4 marks)

6. With the aid of an example in each case, differentiate between *fundamental* and *user defined* data types as applied in a C programming. (4 marks)

7. Write the output that will be produced when each of the following C program segment codes are executed.

(a)
```
int i,j;
i=7;
j=++i + 5;
printf("value of i is %d and j is %d", i,j);
```
(2 marks)

(b)
```
int x,y;
x = 5;
y=--x + 2;
printf("value of x is %d and y is %d", x,y);
```
(2 marks)

8. Outline **four** reasons for carrying out program design during program development. (4 marks)

9. Joseph created arrays in his C program to store data. Outline **four** properties that the data stores would possess. (4 marks)

10. Nancy created a file in C program to store information for her cyber business. State **four** operations that she is likely to carry out in the file. (4 marks)

Section B (60 marks)

*Answer any **FOUR** questions in this section*

11. (a) State **two** features of a user friendly program. (2 marks)

(b) Describe **two** types of test data that may be used during program testing. (4 marks)

(c) Henry constructed a flowchart as shown in figure 1. Use it to answer questions that follow.

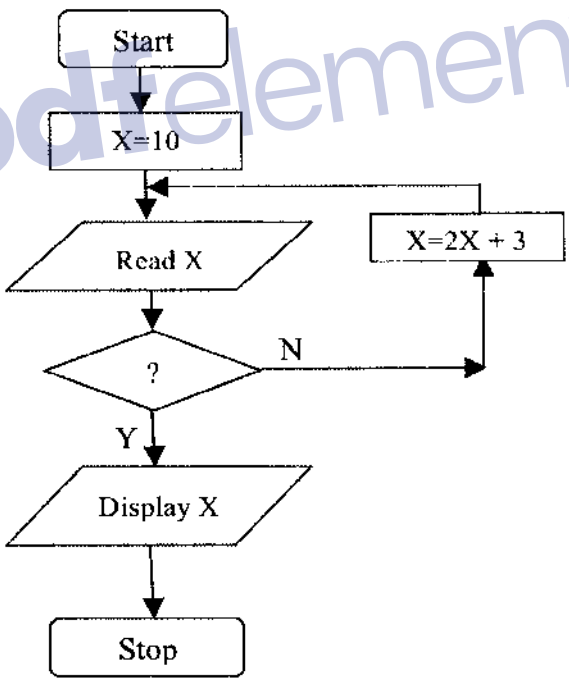

Figure 1

Write the output that will be generated when the statement in decision is:

(i) X<50 (1 mark)

(ii) X<=50 (1 mark)

(iii) X=49 (1 mark)

(d) Write a C program that would prompt a user to enter the number of acres of land to be bought. If the number is greater than five, the price per acre is Ksh.1.0 Million else the price is Ksh. 1.2 Million. The program then computes and displays the total cost of the land purchased. (6 marks)

12. (a) Outline **four** approaches that could be used to implement internal documentation of a program under development. (4 marks)

(b) The following is a segment code of a C program. Use it to answer the question that follows.

```
void main ()
      {
      FILE *fp;
      fp=fopen ("C:/myfile.txt",w);
      fprintf (fp, "store this ");
      fclose (fp);
      }
```

(i) (ii) (iii)

Outline the function of the statements labelled (i), (ii) and (iii). (3 marks)

(c) Outline **two** assumptions that programmers make when constructing a binary tree from a given list of elements. (2 marks)

(d) John is developing a program for his client. Explain **three** methods that he would use to detect errors in the program. (6 marks)

13. (a) Outline **two** circumstances that would lead a programmer to choose linked list data structures. (2 marks)

(b) State **two** sorting methods that use the swapping techniques (2 marks)

(c) Draw a program flowchart used to design a system that prompts a user to enter two integers one after the other. The program should then divide the first number by the second and display the result. If the value of the second number is zero, the program should display an error message "Error: Attempt to divide by zero". (5 marks)

(d) With the aid of a diagram in each case, distinguish between a *stack* and a *queue* as used in programming. (6 marks)

14. (a) Outline **four** advantages of using a pseudocode over a flowchart in program design. (4 marks)

(b) State **three** traversals methods that can be used in a tree data structure. (3 marks)

(c) The following program was written by a student during a C programming language lesson.

```
#include<stdio.h>
main()
{
printf(" programming is fun\n");
main();
}
```

Interpret the program codes. (2 marks)

(d) Peter created an array A in a C program to store ten elements of integer type. Write a segment code that would be used to search for an element in the array using a linear search technique. (6 marks)

15. (a) Outline **four** advantages that a programmer may accrue from using subprograms when developing a system to use in a firm. (4 marks)

(b) Maria, a programmer was given a monolithic program to modify. Outline **two** difficulties that she is likely to encounter. (2 marks)

(c) Convert the following if statement segment to its equivalent *switch* statement segment as applied in C program. (5 marks)

```
If sal>50000
     tax=sal*0.3;
else If sal>30000
     tax=sal*0.25;
else If sal>20000
     tax=sal*0.2;
else If sal>10000
     tax=sal*0.1;
else
      tax=0;
```


(d) Differentiate between a *while* and *do..while* loops as applied in C programming language. (4 marks)

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