1920/203
STRUCTURED PROGRAMMING
November 2017
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN INFORMATION TECHNOLOGY

MODULE II

STRUCTURED PROGRAMMING

3 hours

INSTRUCTIONS TO CANDIDATES

*This paper consists of 15 (FIFTEEN) questions in **TWO** sections; **A** and **B**.*
*Answer **ALL** the questions in **section A** and any **FOUR** questions.*
*in **section B** in the answer booklet provided.*
Candidates should answer the questions in English.

This paper consists of 4 printed pages.

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

Turn over

SECTION A (40 marks)

*Answer **ALL** questions in this section.*

1. Explain the difference between *bubble sort* and *merge sort* as used in programming. (4 marks)

2. Differentiate between *ordered* and *unordered* linear search as used in searching. (4 marks)

3. (a) State **two** disadvantages of programming in machine language. (2 marks)

   (b) State the role of a *linker program* during program translation. (2 marks)

4. Describe *high level programming language* giving **two** examples. (4marks)

5. Describe *internet based programming* giving **two** examples of languages that support this approach. (4 marks)

6. Using an example in each case, differentiate between *declared constant* and *defined constant* as used in C programming. (4marks)

7. (a) Explain a circumstance under which *relational operators* would be preferred over *logical operators* in a C program. (2 marks)

   (b) Differentiate between *static array* and *dynamic array* as used in C programming. (2 marks)

8. (a) Explain the condition that must be satisfied before *binary search* is applied on an array of data elements. (2 marks)

   (b) Outline **two** operations that could be performed in a *queue data structure*. (2 marks)

9. (a) Use C programming language to create a structure that can be used to store these details: *Name, IdNo, Gender, Age, Department, Salary*. (3 marks)

   (b) For the structure created in (a), declare an appropriate variable that can be used to access the values. (1 mark)

10. Explain **two** reasons why program documentation is necessary during program development. (4 marks)

SECTION B (60 marks)

*Answer **FOUR** questions in this section.*

11. (a) Given that 1 Kilometre is equivalent to 1000 Metres, write a C program code that would prompt a user to enter a value in Kilometres and convert it into Metres then display the results. (4 marks)

(b) Write a C program code that prompts a user to enter a value and determines whether it is odd or even number. (5 marks)

(c) With the aid of a diagram in each case, describe the following as applied in flowcharts:

(i) Process;

(ii) Input/Output;

(iii) Decision. (6 marks)

12. (a) Outline **five** steps of solving a problem through computer programming. (5 marks)

(b) Write a C program code that creates an array containing the following values:

45, 25, 56, 23, 89, 45

The program should then calculate the sum of the values and display the result. (6 marks)

(c) Differentiate between *scanf()* and *printf()* functions as used in C programming language. (4 marks)

13. (a) Outline **three** rules that should be followed when naming identifiers in C programming. (3 marks)

(b) Explain the term *function* stating its syntax in C programming. (4 marks)

(c) Table 1 shows the ages of people and their corresponding comments. Use it to answer the question that follows.

Age (in years)	**Comment on age**
Less than 18	Your age is under 18 years
Greater than 18 years	Your age is over 18 years

Table 1

Using C programming language, write a program code that prompts a user to enter ones age then the program displays an appropriate comment. (6 marks)

(d) Use C program statements to show how a text file named *program.txt* can be created using a pointer. (2 marks)

14. (a) Table 2 shows some values and the corresponding days of the week. Use it to answer the question that follows:

Value	Day of the week
1	Monday
2	Tuesday
3	Wednesday
Any other value	Day not considered

Table 2

Use the *switch* statement to write a C program that prompts a user to enter a value then the program displays the corresponding day of the week. (6 marks)

(b) Differentiate between *local variable* and *global variable* as used in C programming. (4 marks)

(c) Write a C program that uses a pointer to change the value of a variable x from 10 to 15. (5 marks)

15. (a) The following is a C program code that has errors. Use it to answer the question that follows.

```
#include<stdio.h>
int main()
{
int x,y;
printf("enter value of x \n");
scanf("%d",x);
if (x>20);
printf("the value is greater than 20 and it is ",x);
return 0;
}
```

Identify the errors and rewrite the correct program code. (6 marks)

(b) Brenda intends to buy 4 loaves of bread and 5 packets of milk. If each loaf of bread costs Kshs 50 and a packet of milk costs Kshs 45, write a C program that could be used to calculate and display the amount of money she will spend. (5 marks)

(c) Explain the difference between *logical errors* and *syntax errors* as used in C programming. (4 marks)

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