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.

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. (4 marks)

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. (4 marks)

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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