

1920/203

STRUCTURED PROGRAMMING

July 2016

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN INFORMATION TECHNOLOGY

STRUCTURED PROGRAMMING

3 hours

INSTRUCTIONS TO CANDIDATES

*Answer All questions in section A and any **FOUR** in section B in the Answer booklet provided.
Candidates should answer the questions in English.*

This paper consists of 6 printed pages.

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

© 2016 The Kenya National Examinations Council.

Turn over

SECTION A (40 marks)

Answer *ALL* the questions in this section.

1. (a) List **four** computer generation programming languages. (2 marks)
 (b) Outline **two** advantages of using *web scripting* Programming languages in system development. (2 marks)
2. (a) Outline a function for each of the following software as used in programming:
 (i) editor; (1 mark)
 (ii) compiler. (1 mark)
 (b) Describe the term *dereference operator* as used in computer programming. (2 marks)
3. (a) Define the term *loader* as used in programming. (2 marks)
 (b) The following elements are to be stored in a data structure. Declare a structure named *Student* with two instances named *student1* and *student2*. (2 marks)
 Serial_Number
 Student_number
 fee_paid
4. Outline **four** factors to consider when selecting a computer programming language. (4 marks)
5. Explain **two** examples of *test data* used during program development. (4 marks)
6. Amina would like to write a computer program that accepts two integers. The program should also compute and output their product. Draw a flowchart to represent the logic of the program. (4 marks)
7. With the aid of diagrams, outline the difference between a *circular linked list* and a *linear linked list*. (4 marks)
8. Describe **two** tools that could be used in program design stage, other than a flowchart. (4 marks)
9. Write a C program that would output 10 integers to a file. (4 marks)

10. (a) Interpret the following program segment.

(2 marks)

```
#include<stdio.h>
int main()
{
    int i=1;

    while(i<=10)
    {
        printf(" My First ");
        printf("C Program\n");
        i=i++;
    }
    return 0;
}
```

- (b) Outline two reasons that would justify the use of binary files.

(2 marks)

SECTION B (60 marks)

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

11. (a) Explain the function of each of the following operators as used in C programming:
- (i) assignment; (2 marks)
 - (ii) relational. (2 marks)
- (b) Differentiate between *double* and *float* data types as used in C Programming. (4 marks)
- (c) Write a C program that would be used to calculate and output the sum and product of all the numbers in the range 1 to 5. Use *for* control structure (7 marks)
12. (a) (i) Explain **one** way of coping with new programming languages. (2 marks)
- (ii) Figure 1 shows a data structure concept used in programming. Identify the function of the parts labeled I and II. (2 marks)

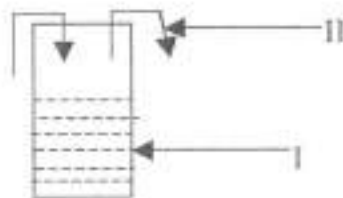


Figure 1

- (b) Outline the steps that could be followed to bubble sort the following elements in ascending order. (6 marks)
- 10 19 0 18 2 1
- (c) Write a C program that accepts the base and height of a right angled triangle and also computes and outputs the area of the triangle. (5 marks)
13. (a) (i) Explain **two** circumstances under which trees are most appropriate in programming. (3 marks)
- (ii) Given that $a=8$, $b=6$ and $c=2$, compute the value of Z in the following C statement. (2 marks)
- $Z=(a\%b)*c+b*c+a;$

- (b) Write a C program that computes and outputs the product of numbers in the range 1 and 5. Represent the logic of the program logic using a flowchart. (5 marks)
- (c) Figure 2 represents a ring. Write a C program that accepts radius R and r of the ring. The program should then compute the area of the shaded area through the use of a function. The program should then output the area of the ring. (5 marks)

Hint: Area = $\pi R^2 - \pi r^2$

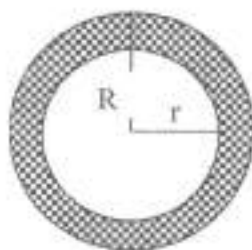


Figure 2

14. (a) Write a C programming language input statements that would be used to input each of the following data using the computer keyboard:
- (i) 34.9 (1 mark)
 - (ii) Computer (1 mark)
 - (iii) 90 (1 mark)
 - (iv) A0023 (1 mark)
- (b) Hannah would like to incorporate an insertion sort code in a program she was developing. Outline **three** advantages and **three** disadvantages of this type of sorting. (6 marks)
- (c) Write a C program that accepts a name made up of five letters. The program should also output the letters in the reverse order. (5 marks)
15. (a) Annette would like to prepare a program user documentation for a developed system. Outline **five** functions of this documentation. (5 marks)
- (b) Suleiman would like to write a program that would accept marks for four students, obtain their average and then display it. Represent the logic of the program using a pseudocode. (5 marks)

- (c) Write a C program that would be used to delete an element from a queue. (5 marks)

THIS IS THE LAST PRINTED PAGE.