

1920/203

STRUCTURED PROGRAMMING

November 2021

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 in section B in the answer booklet provided.

Candidate 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. (a) Outline **three** types of *C tokens* used in a C program. (3 marks)
(b) Outline the use of each of the following operators in a C program:
 - (i) relational;
 - (ii) logical;(2 marks)
2. State **three** differences between a *character* and a *string* constant as used in a C program. (3 marks)
3. Outline **three** disadvantages of a *low level* programming language. (3 marks)
4. Joan used *linked list* data structures in her program. Outline **four** advantages she is likely to realise from using this data structures. (4 marks)
5. Explain **one** reason that would make a programmer use of each of the following escape sequence operators in a C program:
 - (i) `\n`
 - (ii) `\r`(4 marks)
6. The surface area of a cuboid is obtained by using the formula $2(\text{width} \times \text{length} + \text{length} \times \text{height} + \text{height} \times \text{width})$. Write a C program that would declare the dimensions and compute the surface area of the cuboid and display on the screen given that the length = 10, width = 20 and height = 40. (4 marks)
7. Johnson intends to name *identifiers* when writing a C program. Outline **three** rules that he should observe. (3 marks)
8. Explain **two** ways of defining constants in a C program. (4 marks)
9. Distinguish between a *pointer* and an *iterator* as used in C programming. (4 marks)
10. (a) Outline **three** advantages of using a *call by reference* method as used in a C programming language. (3 marks)
(b) John a programming student opted to use an objected oriented programming language to write a program. Outline **three** features of this language that he is likely to use. (3 marks)

SECTION B (60 marks)

Answer any **FOUR** questions in this section

11. (a) (i) Explain the term *sorting* as used in C programming data structures. (1 mark)
(ii) State **four** examples of sorting techniques used in data structures. (2 marks)
- (b) Figure 1 shows a binary tree having the nodes A, B, C, D and E. Use it to answer the questions that follow.

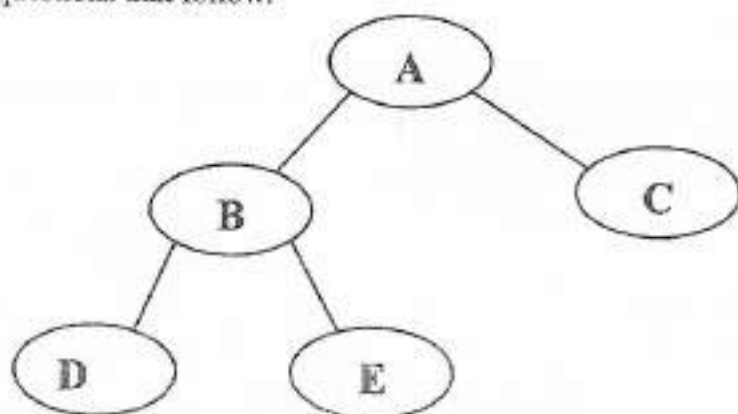


Figure 1

- Using the figure, state **two** characteristics of the binary tree. (2 marks)
- (c) Differentiate between an *assembler* and a *compiler* as used in programming. (4 marks)
- (d) Explain **three** disadvantages of not following a *program development life cycle* during the development of software. (6 marks)
12. (a) State the format specifics used with a *printf* statement to display each of the following:
- (i) a value of an integer;
 - (ii) a string variable;
 - (iii) a hexadecimal value. (3 marks)
- (b) Distinguish between *top down* and *bottom up* program design approach as used in programming. (4 marks)
- (c) State one reason for performing each of the following program testing when developing a program:
- (i) security;
 - (ii) functional. (4 marks)
- (d) Anne would like to include *pointers* in a program she is writing. Outline **four** advantages of using pointers. (4 marks)

13. (a) The following is a syntax of a structure statement in a C program. Use it to answer the question that follows:

`Student.firstname`

State the function of the dot(.) operator in the statement. (2 marks)

- (b) Explain the function of each of the following declared function prototype statements in a C program:

(i) `float area(int,int)`

(ii) `int sum(int).`

(4 marks)

- (c) A student used expressions in a C program that he developed. Outline **three** types of expressions that he may have used. (3 marks)

- (d) Write a C program that would prompt for 5 numbers one after the other and print the sum of the numbers using an array. (6 marks)

enable the user to add their own function to the library
it produces efficiency
programs
it supports loose typing where characters can be treated as integers

14. (a) Outline **three** advantages of structures in a C program. (3 marks)

- (b) Jane documented a program she developed using a C programming language. Describe **three** types of documentations she may have included. (6 marks)

- (c) Write a C program that would display the following pattern when executed. Use a for loop statement.

1 1

2 2

3 3

4 4

(6 marks)

15. (a) Distinguish between `printf()` and `putchar()` function as used in C programming language. (4 marks)

- (b) Explain the function of each of the following commands in a C program:

(i) curly braces;

(ii) `return 0;`

(iii) `#include <stdio.h>`

(6 marks)

- (c) Write a C program that accepts a string of 10 characters and prints the first and last character of the string. (5 marks)

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