

061006T4ICT
ICT TECHNICIAN LEVEL 6
ICT/OS/IT/CR/10/6
DEVELOP COMPUTER PROGRAM
Mar. /Apr. 2023
Time: 3 Hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

WRITTEN ASSESSMENT

3 Hours

INSTRUCTIONS TO THE CANDIDATE:

Maximum marks for each question are indicated in ().

*This paper consists of **TWO** sections: **A** and **B**.*

*Answer **ALL** questions in section **A** and **THREE** questions from section **B** in the answer booklet provided.*

Candidate should answer 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.

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SECTION A (40 marks)

Answer *ALL* the questions in this section.

1. State **three** non-primitive data types in Java. (3 Marks)
2. Outline **four** characteristics of C programming language. (4 Marks)
3. List **two** control structures used for iteration in Java programming. (2 Marks)
4. Explain **two** preprocessor directives in C language. (4 Marks)
5. Differentiate between *encapsulation* and *abstraction* as used in Object Oriented Programming. (4 Marks)
6. The following program segment is written in Java language. Use it to answer the question that follows.

```
Public class Large{  
    public static void main(String args[]) {  
        int a, b;  
        a=20;  
        b=30;  
        big = (a>b) ? a : b;  
        system.out.println("The largest value is : " + big); }  
    }
```

- State the output generated by the following program segment. (2 Marks)
7. Explain **two** importance of acceptance testing for a program. (4 Marks)
 8. (a) Doreen intends to carry out user training on a new developed system. Describe **two** methods she could use for training. (4 Marks)
(b) Explain **one** reason for performing integration testing to a program. (2 Marks)
 9. Given that a=12 and b= 2, c = 5, d = 8. Evaluate the following expressions in Java language. Show your working.
 - (i) $Z = a * b / d \% c;$ (3 Marks)
 - (ii) $-- a;$ (1 Mark)
 10. (a) Classify the words as either keywords or identifiers in Java language. (3 Marks)

Abstract, final, average, null, total, short

- (b) Differentiate between *syntax* and *logical* errors in programming. (4 Marks)

SECTION B (60 marks)

Answer any **THREE** questions in this section

11. a) Define the term source code as used in programming. (2 Marks)
- b) Explain **two** importance of generating a user manual for a program. (4 Marks)
- c) i) Explain **two** functions of a compiler in C programming. (4 Marks)
- ii) Differentiate between *imperative* and *declarative* programming languages. (4 Marks)
- d) Write a program in C language that prompts a user to enter Marks for five subjects. The program then computes the average and displays the result as a two decimal point value. (6 Marks)
12. a) Outline **four** rules for naming identifiers in C language. (4 Marks)
- b) Distinguish between *instance* and *class* variables as used in Java. (4 Marks)
- c) Write a program in Java that prompts for entry of two integers. The program should provide methods to enter, add, subtract, multiply and print the results. (6 Marks)
- d) James an ICT technician implemented a system in a company. He is tasked to develop a maintenance schedule.
- i) Describe **two** maintenance tools he is likely to use; (4 Marks)
- ii) In case bugs are detected in this system, explain the process of rectifying the bugs. (2 Marks)
13. a) Outline **four** characteristics of a constructor function. (4 Marks)
- b) Explain the try – catch method of exception handling in Java. (2 Marks)

c) Write a program in C language that prompts a user to enter time taken in minutes or hours. Based on the units given the program should convert to hours or minutes respectively using a function. (8 Marks)

d) Write a program in Java to display the following pattern. (6 Marks)

```
1   2   3   4
1   2   3
1   2
1
```

14. a) i) Define an abstract class as used in Java. (2 Marks)

ii) Leila was hired by a company to develop for them a tailor-made software. Explain **two** program development approaches she could use. (4 Marks)

b) AngiTech company intends to add a new program module to their existing system. Explain the type of maintenance they need to carry out to this system. (2 Marks)

c) A student accesses their reports through a portal. A student logs in by using registration number and a password. This is verified against a registration database. The portal then opens and the student can view their exam report. Represent this logic using a flowchart. (6 Marks)

d) Write a program in Java language that prompts a user to enter a letter of the alphabet. The program outputs “It is a vowel”, otherwise” It is consonant”. Use a switch structure. (6 Marks)

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