

061306T4CSC

COMPUTER SCIENCE LEVEL 6

ICT/OS/CS/CR/04/6/A

UNDERSTAND FUNDAMENTALS OF PROGRAMMING

JULY /AUGUST 2023



TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)

WRITTEN ASSESSMENT

Time : 3 Hours

INSTRUCTIONS TO CANDIDATE

1. *The paper consists of **two** sections: **A** and **B**.*
2. *Answer **ALL** questions in Section **A** and any **Three** from section **B***
3. *Marks for each question are indicated in the brackets*
4. *A separate answer booklet will be provided*
5. *Do not write on the question paper*

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 the questions in this section

1. Identify any TWO object-oriented programming languages other than Java. (1 Mark)
2. Distinguish between local and global variables. (4 Marks)
3. Define the following terms:
 - a. Class (2 Marks)
 - b. Object (2 Marks)
4. Explain THREE types of errors encountered during programming giving examples in each case. (6 Marks)
5. Explain TWO types of code in Java programming language. (4 Marks)
6. Write a program in Java programming language that prompts a user to enter *five* elements and calculate their sum using an array. (4 Marks)
7. Enumerate any TWO rules for creating identifiers in Java. (4 Marks)
8. Highlight FOUR primitive data types in java. (4 Marks)
9. Explain the difference between System.out.print() and **System.out.println()** as used in java programming language. (4 Marks)
10. Enumerate any THREE access modifiers used in a class declaration in Java. (3 Marks)
11. State any TWO keywords that are used for exception handling in Java (2 Marks)

SECTION B (60 MARKS)

Answer any THREE questions in this section

12. Control structures are statements that describe how a program is executed

- a. Discuss THREE types of program control structures. (6 Marks)
- b. Explain THREE advantages of using control structures in Java programming (6 Marks)
- c. Write a program to calculate the sum of following series where n is input by user

$$1 + 1/2 + 1/3 + 1/4 + 1/5 + \dots\dots\dots 1/n \quad (8\text{Marks})$$

13. Inheritance is a concept in Java programming that allows code reusability between classes in a program.

- a. Explain THREE types of inheritance in Java. (6 Marks)
- b. With aid of code, demonstrate implementation of inheritance in Java. (4 Marks)
- c. Explain two differences between method overloading and method overriding as used in programming. (4Marks)
- d. Write an object-oriented program in Java that finds the roots of a quadratic equation. (6 Marks)

$$ax^2 + bx + c = 0$$

$$\Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

The program should specify the nature of the roots. That is,
 if determinant > 0, roots are real and different
 if determinant == 0, roots are real and equal
 if determinant < 0, roots are complex and different

14.

- a. Explain TWO advantages of using objects in program development. (4 Marks)
- b. Write a Java program that accept the radius of a sphere and calculates the volume.
 Given the volume = $4/3\Pi r^3$. (6 Marks)
- c. Briefly explain the following terms as used in Object Oriented Programming giving an example in each case. (4 Marks)
 - i. Abstraction

ii. Polymorphism

- d. Write a Java program to display numbers 2, 4, 6, 8, 10 and 12. (6 Marks)

15.

- a. Given the following code snippet

```
For (int i=0; i<10; i++)
{
    System.out.println(i);
}
```

Rewrite the code using a while loop. (4 Marks)

- b. Write a program to produce the following multiplication table. (8 Marks)

	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

- c. Differentiate between of the following operators. (4 Marks)

i. && and ||

ii. == and =

- d. Explain at least TWO JDK tools and how they used in developing a java program

(4 Marks)

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