061306T4CSC

COMPUTER SCIENCE LEVEL 6

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

ICT/OS/CS/CR/04/6/B

Understand Fundamentals of Programming

July/August 2025

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

PRACTICAL ASSESSMENT

DURATION: TO RUN THROUGHOUT THE TRAINING

INSTRUCTIONS TO CANDIDATE:

1. You are required to perform the following tasks
    - *i. Install Netbeans/Eclipse/Intellij*
    - *ii. Operate in the Java environment*
    - *iii. Write programs using variables and constants*
    - *iv. Write programs that entails the input values from the keyboard.*
    - *v. Use selection control structures(if-then-else)*
    - *vi. Use selection control structure(switch-case)*
    - *vii. Use case statements*
    - *viii. Use for loop*
    - *ix. Use while loops*
    - *x. Use do while loops*

xi. *Use functions/methods*

xii. *Use classes and objects*

xiii. *Implement inheritance*

xiv. *Implement Polymorphism*

2. You have been provided with the following resources:

   i. *A working computer*

   ii. *Internet Access*

Task 1: Installation of Java

You are required to perform the following activities:

i. Download Eclipse/Java NetBeans/IntelliJ

ii. Install Eclipse/Java NetBeans/Intellij

iii. Launch the installation

Task2: Working on the Java Environment

You are required to perform the following activities:

i. Launch the Java application

ii. Create a class in the coding window

iii. Create the main program

iv. Apply System.out.println()

v. Save The Program

Task 3: Use data types in Java program

1.Write a Java program to perform the tasks given below and save it as **person**

i. Initialise the fields name, age, gender, salary

Name	age	gender	salary	disable
Omondi	24	M	12344.56	false

ii. Display the values on the screen to display the format:

Wira Company

Name: Omondi

Age :24

Gender:M

Salary:12344.46

Disable:false

iii. Change the output format of the program person to display the format given below and save it as **person2.**Use escape operators in formatting.

Wira Company

Name	Age	Gender	Salary	Disable
Omondi	24	M	12344.46	false

Task 4: Input value from keyboard and apply if-else-structure

1.Write a program that prompts the age of a student and display "Adult" when the age is 18 years and above, otherwise display" Child".

2.Save the file as **years.**

Task 5: Use case control structure

Write a Java program to input a letter from the keyboard and determine if it's a vowel or not. Use **case structure** and the information given below.

Letter	**output**
A or a	Vowel
E or e	Vowel
I or i	Vowel
U or u	Vowel
Other	Not a vowel

Task 6: Use for loop control structure

Write a Java program by using **for loop** to display odd integers from 1 to 21.

Task 7: **Use while loop and do..while control structure**

i. Write a Java program by using **while loop** to input student name, Kiswahili and English marks scored by a student in a test from the keyboard. The program should calculate the

average mark, display the entered values and the average. The program should capture any number of students.

ii. Copy the program in (i) and implement it by using **do..while** loop. Save the program as **doWhile.**

Task8: Classes and methods/Functions

Write a program that contains a class called Cylinder with two data members height ,radius and a method called getVolume(). The program should calculate the volume through getVolume() method and print the calculations on the screen.

Task 9: Implement inheritance

Write a program that contains a class called Rectangle with two data members length and width. The class contains a derived class called area and a method called getArea(). The program should calculate the area through getArea() method and print the calculations on the screen.

Task 10: Develop a sub-system using Java that calculates the Body Mass Index (BMI) of patients.

A newly launched Matendo Hospital would like to automate its operations to enhance efficiency through a Java-based system. Being a computer Science graduate,the Hospital Management has requested you to develop a sub-system that will be demonstrated as a proposal to the Hospital Directors during the General Meeting, The patient's details name. age. area of residence, gender, mobile, weight and height are captured in manual register. The system should be able to calculate the Body Mass Index(BMI) of a patient from the **weight(kg) and height(m)** provided. and display the patient's details, BMI and status.

The patient data are given as:

Name=Jonathan

Age=36

Area of residence=Kabale

Gender =male

Mobile=0720111111

Weight=56kg

Height=1,5m

Body Mass Index(BMI)=$\underline{\textbf{weight(kg)}}$

$$\textbf{height(m)}^2$$

The status of the patient is determined using the following criteria.

BMI	**Status**
0-18.5	Underweight
18.5-24.9	Healthy
25-29.9	Overweight
30-39.9	Obese
>40	Severe Obese

Implement the following activities.

i. Declared and initialised all the patient's details.
ii. Calculate the BMI.
iii. Determine the patient's status.
iv. Display patient's details
v. Display Calculated BMI.
vi. Display Status.

Task 11: Develop a sub-system using Java that calculates the cost of an item in a shop.

A newly established supermarket would like to computerize its operations to enhance efficiency and improve the sales. Before the system is adopted, a demonstration should be done and you have been requested by the company design and write a program prototype in Java language that will be used as a demonstration during a meeting. The For easy upgrades in future, the prototype should be implemented using **classes, objects and methods.**

The prototype contains:

- class called **Goods**
- data members; code, item Name, category, price and quantity.
- Two methods **getCost()** to calculate the cost of an item and **display()** method to output item details (code, item Name, category, price, quantity) and the calculations on the screen.
- Class called executeGoods to contain the main function, object of the class, inialise data, and call created functions.

Use the sample data given to implement the prototype

Code=1001

Category=

Item=bicycle

Price=6500

Quantity=10

cost=price X quantity

Implement the following activities

1. Launch the java IDE
2. Declare class goods
3. Declare variables(code, item, price, quantity)
4. Declare getCost() function to
5. Calculate cost in getCost() function
6. Declare display() function
7. Output (code, item, price, quantity,cost) in display() function
8. Declare executeGoods class in main program
9. Create object of Goods class
10. Initialise data(code, item, price, quantity)
11. Use created object to call the getCost() function.
12. Use created object to call display () function.