



**UGANDA BUSINESS AND TECHNICAL EXAMINATIONS BOARD**

**Business and Humanities Certificate Examinations**

**NOV-DEC 2021 SERIES**

**PROGRAMME**

**PROFESSIONAL CERTIFICATE IN SOFTWARE ENGINEERING**

**PAPER NAME**

**FUNDAMENTALS OF PROGRAMMING IN JAVA**

**PAPER CODE**

**PCSE 123/2**

**YEAR I, SEMESTER II**

**3 HOURS**

**TUESDAY, 1<sup>ST</sup> FEBRUARY 2022**

**INSTRUCTIONS TO CANDIDATES**

1. *This paper consists of six practical questions. Answer only four questions.*
2. *All questions carry equal marks.*
3. *No communication between candidates is allowed during the examination.*
4. *Transfer your work to a CD that will be handed for marking*
5. ***Do not write anywhere on this question paper.***
6. *All rough work should be done in the official answer booklet provided.*

### **Question One**

In a given semester, a student is only allowed to take on four course units. The marks scored in these course units are summed up to determine the total. Write the java application as follows;

- (i) Use input dialog boxes to capture the student name and marks scored in the four course units.
- (ii) Create a user-defined method add() that takes on four parameters and returns the sum of marks scored.
- (iii) Display the total marks scored using a message dialog box.

(25 marks)

### **Question Two**

At NITA Uganda, one of the junior programmers was asked to create a module of the system. This module reads a client's name, assigns ID number and age. Using the encapsulation concept of java, implement this module.

- (i) Define a class with private members name, ID number, and age.
- (ii) Set and return the name, ID number, and age using the setters and getters methods respectively.
- (iii) Define another class and an object of the type created above.
- (iv) Read/input the name, ID number, and age values and use the object created above and the setter method to hold these values.
- (v) Display the ID number, name, and the age of a client on the console.

(25 marks)

### **Question Three**

A person invests \$1000 in a savings account yielding 5% interest. Assuming that all the interest is left on deposit, calculate and print the amount of money in the account at the end of each year for 10 years. Use the following formula to write a java program to determine the amounts:  $a=p(1 + r)^n$  where

- $p$  is the original amount invested (i.e., the principal)
- $r$  is the annual interest rate (e.g., use 0.05 for 5%)
- $n$  is the number of years
- $a$  is the amount on deposit at the end of the nth year.

(25 marks)

### **Question Four**

Every online student owns an eLearning account that requires a username and password to login. If either the username or password is wrong, then access is denied. Given a username (James), and password (james@2021). Write a java code that allows a user to input username and password. Display a message "Welcome, James" if login details are correct and a message "Incorrect username/password" if login details are wrong. Use the input dialog boxes, and message dialog boxes of the JOptionPane class. (25 marks)

### **Question Five**

- (a) Write a program that prompts the user for a number between 1 and 100, and prints that number. If the number is divisible by three, then print "**Fizz**" instead of the number. If the number is divisible by five, then print "**Buzz**" instead of the number. If the number is divisible by both three and five, then print "**Fizz Buzz**" instead of the number. (15 marks)
- (b) Write a program that adds integers from 1 to 20 except for integer 10 and 11 and prints the sum on a console. (10 marks)

**Turn Over**

## **Question Six**

Standard University enrolls new students for various courses each year. As a registration procedure, each student is required to input their name, age, course and tuition during the registration process. Assuming that you are asked to develop a system module that retrieves the student information captured during registration without using databases, perform the tasks below and write a java program to implement the above module.

- (i) Define two classes **Student** and **StudentTest**
- (ii) Create the four instance variables **name**, **age**, **course**, and **tuition** within the **Student** class
- (iii) Define a constructor of the class **Student** that takes on a parameter **name** and using the **this** keyword assign the value of **name**.
- (iv) Create a method and assign the age of the **Student** to the variable **age**.
- (v) Create a method and assign the **course** to the variable **course**.
- (vi) Create a method and assign the **tuition** to the variable **tuition**.
- (vii) Create the a method that prints **Student** details.
- (viii) In the main method, scan the student details of **name**, **age**, **course**, and **tuition**.
- (ix) Create an object of Employee type and specify its value as a student name.
- (x) Invoke all methods for the object created above.

(25 marks)

**END**