



## UGANDA BUSINESS AND TECHNICAL EXAMINATIONS BOARD

### Business and Humanities Certificate Examinations

NOV-DEC 2022 SERIES

#### PROGRAMME

PROFESSIONAL CERTIFICATE IN SOFTWARE ENGINEERING

#### PAPER NAME

FUNDAMENTALS OF PROGRAMMING IN JAVA (THEORY)

#### PAPER CODE

PCSE 123/1

YEAR I, SEMESTER II

2 1/2 HOURS

TUESDAY, 06<sup>TH</sup> DECEMBER, 2022

#### INSTRUCTIONS TO CANDIDATES

1. This paper consists of **two** sections **A** and **B**.
2. Section **A** is compulsory and carries **20** marks.
3. Section **B** consists of **six** questions. Answer only **four** questions.
4. All questions carry equal marks.
5. All answers for each question should begin on a fresh page.
6. **Do not write anywhere on the question paper**
7. All answers and rough work should be written in the official answer booklet provided.
8. Read other instructions on the answer booklet.

## SECTION A - (20 MARKS)

Answer all questions in this section.

### Question One

- (a) Distinguish between a **constant** and a **variable** as used in Java programming. (04 marks)
- (b) Define the term **ternary operator**. (02 marks)
- (c) Differentiate between **autoboxing** and **unboxing** as applied in Java data types. (04 marks)
- (d) List **three** rules that must be observed when creating identifiers in a Java program. (03 marks)
- (e) Write the basic syntax of a Java code. (03 marks)
- (f) Define the following terms as applied in Java programming; (02 marks)
- (i) Expression (02 marks)
  - (ii) Operators (02 marks)

## SECTION B - (80 MARKS)

Answer only **four** questions from this section.

### Question Two

- (a) The programming industry today presents hundreds of programming languages. Java is one of the high-level programming languages that has taken the world by storm and is cherished by so many programmers. Explain **five** reasons why you would choose Java over other Languages. (10 marks)
- (b) A Java program has a collection of objects that communicate via invoking each other's methods. In light of the above statement and using an appropriate example, explain what the following concepts mean.
- (i) Object (02 marks)
  - (ii) Class (02 marks)
  - (iii) Methods (02 marks)
  - (iv) Instance variables (02 marks)
  - (v) Identifiers (02 marks)

### **Question Three**

- (a) As an experienced Java programmer, explain **four** rules followed while naming identifiers. (08 marks)
- (b) Java reserved words may not be used as constants or variables or any other identifier name. List **six** reserved key words in Java. (06 marks)
- (c) Java supports commenting to make the code readability easier for programmers. Giving an example in each case, explain **two** main commenting styles available for Java programmers. (06 marks)

### **Question Four**

- (a) Define the term **Loop** as used in Java programming. (02 marks)
- (b) Explain **three** main types of loops used in Java programs (06 marks)
- (c) Differentiate between an **inner class** and a **sub-class** in a Java program. (04 marks)
- (d) Discuss **four** access specifiers for Java classes. (08 marks)

### **Question Five**

- (a) Define the term **exception** as applied in Java. (02 marks)
- (b) Explain **four** situations where exceptions may arise in Java. (08 marks)
- (c) Discuss **five** advantages of exception handling in Java. (10 marks)

### **Question Six**

- (a) Explain why Java is regarded as platform independent programming language. (02 marks)
- (b) Object-oriented programming rotates around four main principles that is encapsulation, inheritance, polymorphism and abstraction. In light of the above statement, explain the meaning of each of the underlined principles in relation to Java programming. (08 marks)
- (c) Explain **five** advantages of writing programs using object oriented programming languages like Java over the procedural/structured languages. (10 marks)

### Question Seven

- (a) Define the concept of **constructor overloading**. (02 marks)
- (b) List **four** primitive data types supported by Java programming language. (04 marks)
- (c) Infinite loops are those loops that run infinitely without any breaking conditions. Using an example in each case, explain how an infinite loop is declared using a **For** Loop, **While** Loop and a **Do...while** Loop. (06 marks)
- (d) Explain the meaning of the **final** key word and briefly explain how it is used in a variable, method and a class. (08 marks)

**END**