

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN APPLIED COMPUTER SCIENCE**

ACSC 223: INTRODUCTION PROGRAMMING (JAVA 1)

STREAMS: BSC (APPLIED COMP SCI) Y2S1

TIME: 2 HOURS

DAY/DATE: MONDAY 16/12/2024

8.30 A.M – 10.30 A.M.

INSTRUCTIONS:

- Answer Question **ONE** and any other **TWO** questions.
- Sketch maps and diagrams may be used whenever they help to illustrate your answer
- Do not write anything on the question paper
- This is a **closed book exam**, No reference materials are allowed in the examination room
- There will be **No** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely

SECTION A: COMPULSORY TIME

QUESTION ONE (COMPULSORY): 30 MARKS

- a. Discuss the role of the main() method in java **[4marks]**
- b. With relevant examples, Explain the role of each JDK edition. **[4 marks]**
- c. Each programming language like Java has its own unique syntax and semantics. Explain with examples. **[4 marks]**
- d. Discuss three types of errors, a programmer is likely to encounter when developing java programs. **[4marks]**
- e. Java methods have parameters which accept arguments. Explain the role of each with an appropriate example. **[4 marks]**
- f. Programmers developing Graphical desktop applications may prefer to use swing components over java AWT components, Explain. **[4marks]**

d. When building large software applications, programmers utilize the concept of layering to separate various software components. Classify and discuss any three layers of separation and the need to. **[6marks]**

SECTION B:[ATTEMPT ANY TWO QUESTIONS FROM THIS SECTION]

QUESTION TWO:

- a. Object oriented programming helps one to solve problems, which is the main purpose of writing computer programs. Discuss the five (5) steps of problem solving. **[10 marks]**
- b. A **palindromic** word is one that reads the same backwards as forwards. Hence the words hello and peel are not palindromes, but the words **peep**, **deed**, and **aibohphobia** (fear of palindromes) are palindromes.
- (i) Define a class called Palindrome, with its constructor. **[4 marks]**
- (ii) In your Palindrome class, create a method called reverse () which takes a string argument. Your method should return the reverse of the argument as a string. **[2 marks]**
- (iii) Create a second method in Palindrome called is Palindrome() which takes a string argument. This method should return True if the argument is a palindrome and False otherwise. **[4 marks]**

QUESTION THREE (20 MARKS)

Discuss the following terms, as used in java programming. For each term, use a code example to demonstrate its implementation.

- (i) Inheritance **[5 marks]**
- (ii) Polymorphism **[5 marks]**
- (iii) Encapsulation **[5 marks]**
- (iv) Abstraction **[5 marks]**

QUESTION FOUR (20 MARKS)

- a. State affects behavior of an object, and behavior affects state. Define a class, with attributes and methods to explain this statement. **[4 marks]**
- b. Java class which contains the **abstract** keyword in its declaration is known as abstract class. Abstract classes with its methods must be implemented by the calling classes. Use code examples to demonstrate the implementation of such classes and discuss the benefits they introduce to java programmers. **[4 marks]**
- c. If a method is declared to return a value, a value of the declared type must be returned. Demonstrate **[4 marks]**
- d. **Accessors** and **Mutators** let java programmers to get and set things usually instance variables values. Discuss with relevant examples. **[8 marks]**

QUESTION 5 (20 MARKS)

- a. Discuss the three (3) Steps of object creation in java. **[6 marks]**
 - b. Discuss the various types of polymorphism **[4 marks]**
 - c. With the use of code to illustrate your answer, discuss dynamic binding. **[6 marks]**
 - d. Explain the conditions under which object's finalize() method is invoked by the garbage collector **[4 marks]**
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