ACSC 223

CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE

ACSC 223: INTRODUCTION PROGRAMMING (JAVA I)

STREAMS: BSC   **TIME: 2 HOURS**

DAY/DATE: TUESDAY 29/08/2023   **11.30 A.M – 1.30 P.M.**

INSTRUCTIONS:
- Answer Question **ONE** and any other **TWO** questions.

Question one (Compulsory): 30 Marks
    a. The Java programming language has its own **language specification**, **API**, **JDK** and **IDE**. Discuss   **[4marks]**
    b. Java Language is full-fledged and powerful language that comes in three editions. Explain each with its application areas.   **[4 marks]**
    c. Each programming language like Java has its own unique syntax and semantics. Explain with examples.   **[4 marks]**
    d. One is likely to encounter three types of errors when developing java programs. Discuss.   **[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]**

QUESTION TWO (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]

QUESTION THREE [20 MARKS]

   (a) Discuss the four principle of object oriented programming.   [16 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]

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.   **[8 marks]**

   b. If a method is declared to return a value, a value of the declared type must be returned. Demonstrate   **[8 marks]**

   c. **Accessors** and **Mutators** let java programmers to get and set things usually instance variables values. Discuss with relevant examples.   **[4 marks]**

QUESTION 5 20 MARKS

   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.   **[10marks]**

   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.   **[4marks]**

   (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]