PAC INSTITUTE OF TECHNOLOGY AND SOCIAL STUDIES
END OF TERM 2 2024 ASSESSMENT

FORMATIVE ASSESSMENT

Qualification Code : 061306T4CSC

Qualification : COMPUTER SCIENTIST LEVEL 6

Unit Code : IT/CU/ICT/CR/7/6

Unit of Competency : FUNDAMENTALS OF PROGRAMMING (JAVA)

CLASS : DCS

TIME : 2 HOURS

INSTRUCTIONS TO CANDIDATE:

1. *Read all the instructions carefully before attempting the question*
2. *This paper consists of two sections, A and B*
3. *You are allowed 2 Hours to Answer the questions*
4. *Marks for each question are indicated in brackets*
5. *Write your responses in the Separate Answer booklet provided*
6. *Do not write anything in this question paper*

SECTION A [40 MARKS]

Answer all questions in this section.

1. Explain any **FOUR** data types as used in Java Programming. (4 marks)
2. Highlight **FOUR** features of java programming. (4 marks)
3. Write a java program that implements a class named Odd with a data member named x, the program should **ACCEPT INPUT** from the user and determine whether the input is **ODD OR EVEN** and displays an appropriate message. Use the if statement. (6 marks)
4. Outline **FOUR** rules regarding the use of identifiers in Java. (4 marks)
5. Write a java program that takes **TWO NUMBERS** as input and displays the product of two numbers. (6 marks)
6. Write a Java program that takes **THREE NUMBERS** from the user and prints the greatest number. (6 marks)
7. Explain two **TYPES OF CODES** as used in Java Programming. (4 marks)
8. Demonstrate **THREE** basic data operations in Java. (6 marks)
9. Demonstrate the use of **METHODS** in Java. (4 marks)
10. Describe the **SYNTAX** and use of the for loop in Java. (4 marks)

SECTION B [60 MARKS]

Answer any three questions in this section.

11. a) Explain **TWO** advantages of using objects in program development. (4 marks)

b) Write a java program that accept the radius of a sphere and **CALCULATES THE VOLUME**. Given the volume = $4/3\pi r3$.
(8 marks)

c) Briefly explain the following terms as used in **OBJECT ORIENTED PROGRAMMING** giving an example in each case.

i. Abstraction (4 marks)
ii. Polymorphism (4 marks)

12. a) Write a java program to display numbers 2, 4, 6, 8 , 10 and 12. **USE FOR LOOP**. (6 marks)

b) Given the following code snippet

```
For (int i = 0; i< 10; i++)

{

System.out.println(i);

}
```

i. Rewrite the code using a **WHILE LOOP**. (4 marks)

ii. Explain at least **TWO** JDK tools and how they used in developing a java program. (4 marks)

c) What is **METHOD OVERRIDING** in Java? Provide an example where method overriding is used in an inheritance hierarchy. (6 marks)

13. Use the following code to answer the questions that follow:

```
Public class ThreeNumberAddition {

Public static void main (String [] args) {

// create a Scanner object to read input from the user

Scanner = new Scanner (System.in)

// prompt the user to enter three numbers

System ("Enter the first number")

double num1= scanner.nextDouble()

System("Enter the second number");

double num2 = scanner.nextDouble();

System("Enter the third number");

double num3 = scanner.nextDouble()

// calculate the sum of the three numbers

sum = num1 + num2 + num3

// Use an if statement to check if the sum is greater than 10

if (sum > 10) {

System.out.println("The sum of the three numbers is greater than 10")

} else {

System.out.println("The sum of the three numbers is not greater than 10")

}  // Close the Scanner

Scanner.close();

}}
```

i. Identify **FOUR** bugs in the code (4 marks)

ii. Re – write the code correctly (6 marks)

iii. Explain the concept of inheritance in Java. (4 marks)

iv. Demonstrate inheritance with an example in Java. (6 marks)

14. Procedural programming is about writing procedures or methods that perform operations on the data, while object-oriented programming is about creating objects that contain both data and methods.

i. Explain the **FOUR** pillars of Object-Oriented Programming (OOP) in Java with examples. (6 marks)

ii. What is the purpose of **CLASSES** and objects in Java? Demonstrate how to create and use a class in Java. (8 marks)

iii. Explain the concept of **CONSTRUCTORS** in Java. Provide an example where a constructor initializes object values. (6 marks)