JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

DEPARTMENT OF COMPUTER SCIENCE & SOFTWARE ENGINEERING

UNIVERSITY EXAMINATION FOR THE DIPLOMA IN LINUX ENGINEERING

2ND YEAR 2ND SEMESTER 2022/2023 ACADEMIC YEAR

KISUMU LEARNING CENTER

COURSE CODE: ICT 2212

COURSE TITLE: INTRODUCTION TO JAVA PROGRAMMING

EXAM VENUE: **STREAM:**

DATE: **EXAM SESSION:**

TIME:

INSTRUCTIONS

1. **Answer Question 1 (Compulsory) and ANY other TWO questions**
2. **Candidates are advised not to write on the question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

Question 1 [30 marks]

(a) Write a simple java code that will print the words “My First Java Program!”(4 marks)

(b) What is object-oriented programming (2 marks)

(c) Explain the following object-oriented programming concepts

i. Object (2 Marks)

ii. Class (2 Marks)

iii. Methods (2 Marks)

(d) List two IDEs available for Java language. (2 marks)

(e) Java is case-sensitive, explain (2 marks)

(f) Highlight the two categories of modifiers that are available in java. (2 marks)

(g) Explain the following object-oriented programming concepts

i. Inheritance (2 Marks)

ii. Polymorphism (2 Marks)

iii. Encapsulation (2 Marks)

(h) State the types of variables in java (2 marks)

(i) State the benefits of using object-oriented programming language

(j) such as java language (4 marks)

QUESTION 2 [20 MARKS]

a) What is the output of the following code snippet **(6 marks)**

```
class ArithmeticExample {
   public static void main (String[] args) {
      int a;       // This declares a variable
      int b;       // This declares another variable
      a = 2048;      // This assigns 1024 to a
      System.out.println("The Variable a contains " + a);
      b = a / 2;
      System.out.print ("b contains a / 2: ");
      System.out.println(var2);
   }
}
```

b)

i. Write the syntax of a while loop **(3 marks)**

ii. Write a Java code that utilizes a while loop to display all the even numbers from 1 to 20 (inclusive). Ensure that the code prints each even number on a new line. **(6 marks)**

c) Explain any five benefits of Object-Oriented Programming (OOP) **(5 marks)**

QUESTION 3 [20 MARKS]

a) Programming in Java can sometimes be challenging due to the presence of errors. Explain the following types of errors.

i. Runtime errors **(2 Marks)**

ii. Syntax errors **(2 Marks)**

b)

i. Write the syntax for a while loop. **(2 marks)**

ii. Write a Java code snippet that employs a 'while' loop to output 'x' values ranging from 10 to 19. (8 marks)

c) Write a Java code snippet that creates an object named "student" and, when compiled, produces the following output:
"Enrolled Student's name is: Alice." **(6 marks)**

QUESTION 3 [20 MARKS]

a) Y

are tasked with creating a program in Java to collect exam marks for Linux Engineering students.

Your program should:

i. Prompt the user to enter the name of a diploma student.

ii. Prompt the user to enter the exam marks for that student (an integer value).

iii. Display a message showing the student's name and marks.

Write the Java program to accomplish this task and demonstrate its functionality with sample input and output for one student **(10 Marks)**

b)

i) Explain what a variable is as used in Java programming. Describe its purpose and usage in Java programs. **(4 marks)**

ii) Write a Java code snippet that takes two variables, one integer, and one string as input. Provide a brief explanation of the code's functionality. **(6 marks)**

QUESTION 4 [20 MARKS]

a) Write a Java code that will display all the elements of an array itemsList. The array itemsList should have five elements of your choice, including at least two string elements.
In your answer, provide both the Java code and the expected output when executing the code with your chosen array elements. **(10 marks)**

b) Write a Java program that takes two numbers as input and prints the two numbers after execution. Sketch the outputs expected **(7 Marks)**

c) List and briefly explain any three operators in Java. **(3 marks)**

QUESTION 5 [20 MARKS]

a) Explain the implications of the java class introductory words

i) Public **(2 Marks)**
ii) Static **(2 Marks)**
iii) Void **(2 Marks)**
iv) main () **(2 Marks)**

b) The Chair of the Department of Computer Science and Software Engineering (CSSE) within the School of Informatics and Innovative Systems (SIIS) at Jaramogi Oginga Odinga University of Science and Technology (JOOUST) has requested your assistance in creating a Java program to aid the faculty in determining students' final grades according to the university's grading criteria.

Task:
Develop a Java program that accepts a student's examination scores as input and allocates a grade based on the subsequent criteria:

For scores of 70 or higher, assign the grade 'A.'
For scores between 60 and 69 (inclusive), allocate the grade 'B.'
For scores ranging from 50 to 59 (inclusive), assign the grade 'C.'
For scores between 40 and 49 (inclusive), provide the grade 'D.'

For scores below 40, indicate a grade of 'F' (Fail).

Write the Java program to implement this grading system, and demonstrate its functionality with sample input and the corresponding grade. **(12 Marks)**