DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

University Examinations 2019/2020

SECOND YEAR **SEMESTER** II EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE IN COMPUTER SCIENCE

CCS 2211: OBJECT ORIENTED PROGRAMMING

DATE: AUGUST 2020 **TIME: 2 HOURS**

Instructions: Answer Question 1 and Any Other Two.

Question 1: (30 Marks)

a) Explain any **FOUR** features of Java as a programming language**. (4 Mark)**

b) Using a diagram, explain what you understand by the term Java Virtual Machine (JVM). **2 Marks)**

c) Study the program below and answer the questions below.

```
3  public class HelloWorld {
4
5      public static void main(String[] args) {
6          System.out.println("Hello World");
7      }
8
9  }
```

i. Explain the meaning of line 3 **(2 Marks)**

ii. Explain the meaning of line 5 **(2 Marks)**

iii. Explain the meaning of line 6 **(2 Marks)**

iv. What is the output of the program? **(1 Mark)**

d) Using an example in each case, discuss the **TWO** categories of datatypes. **(4 Marks)**

e) Using a suitable example in each, discuss the two types of type casting **(4 Marks)**

f) Study the following program and write the output for each statement **(3 Marks)**

```
public class JavaOperators {
      public static void main(String[] args) {
            int a = 10;
            int b=20;
            int c;
            System.out.println(c = a); // Output
            System.out.println(b += a);// Output
            System.out.println(b -= a);// Output
            System.out.println(b *= a);// Output
            System.out.println(b /= a);// Output
            System.out.println(b %= a);// Output
            System.out.println(b ^= a);// Output
          }

}
```

g) Write a program that captures two inputs and display the output as follows when executed. **(4 Marks)**

```
Input the first number:  256
Input the second number:  326

Sum: 582
```

h) What is the output of the following program? **(2 Marks).**

```
class IfElse {
    public static void main(String[] args) {
        int number = 10;

        // checks if number is greater than 0
        if (number > 0) {
            System.out.println("The number is positive.");
        }
        else {
            System.out.println("The number is not positive.");
        }

        System.out.println("This statement is always executed.");
    }
}
```

Question 2: (15 Marks)

a) Derrick attained the following marks in the four units he sat last semester:

Unit	Mark
CCS101:	70
CCS102:	68
CCS103:	74
CCS104:	65

i. Write the code to store the above marks in an array. **(2 Marks)**

ii. Write a program to determine and display the highest mark. **(5 Marks)**

b) Using a function that gets two inputs from the main program, sums them and returns the result to the main program, write a program to achieve the above. The output should be: **THE SUM IS:** **(4 Marks)**

c) Declare an array that can hold the marks of 5 units for 4 students; **(2Marks)**

d) Differentiate between formal parameters and actual parameters **(2 Marks)**

Question 3: (15 Marks)

a) Outline the **FIVE** steps to be followed during java database connectivity. **(5 Marks)**

b) Write the code to create a connection to a mysql database named: student, username:root, password:user. **(2 Marks)**

c) The department of Computer Science in Dedan Kimathi University of Technology is planning to implement a unit selection system where students will be selecting the units they will pick for the current semester. In view of the above:

i. Sketch a JFrame to enable the Chair of Department populate the following unit details: Unit Code, Unit Name, Number of hours. **(3 Marks)**

ii. Write the sql code that would generate a table named units to store the details. **(2 Marks)**

iii. Write a program to store the details filled in the form into the units table created. **(3 Marks)**

Question 4: (15 Marks)

a) State and explain the **FIVE** types of inheritance **(5 Marks)**

b) You have been procured to help in the development of Dedan Kimathi University Management System utilising the Inheritance concepts. Write the code to achieve the following:

i. Create a base class named persons with the following properties: name, age, email and the following methods: login(), check timetable(); **(3 Marks)**

ii. Create a subclass of lecturer with the following additional properties: StaffNo, Designation and methods:check payslip, upload results. **(3 Marks)**

c) Dedan Kimathi computer science students have invited you as a guest speaker to give a talk on method overriding. In light of the above

i. Explain to the students what method overriding means **(2 Marks)**

ii. Write a sample program implementing method overriding **(2 Marks)**