Final Term Exam

Course Name: Object Oriented Programming (Lab)

Submitted By:

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BS (SE-8) Section: A

Submitted To:

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Dated: 12ᵗʰ July 2020

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Department of Computer Science

Final Term Exam Spring 2020

Subject: Object Oriented Programming (Lab)

BS (CS,SE)   Instructor: M.Ayub Khan

There are total **5** questions in this paper.

Note:

At the top of the answer sheet there must be the ID, Name and semester of the concerned Student.

Students must have to provide the output of their respective programs. Students have same answers or programs will be considered fail. Programs in Java or codes should be explained clearly.

As this paper is online so incase of any ambiguity my Whatsapp no. is 034499121116.

Each question carry equal marks.
Please answer briefly.

Q1. How to check Even and Odd numbers in java using object oriented approach?

Q2. How to add 2 complex numbers in java using object oriented approach?

Q3. How to check Leap year in java using object oriented approach?

Q4. How to check that the input from the user is the vowel or not in java using object oriented approach?

Q5. How to use power of a number in java using object oriented approach?

Question 1

Answer:

<u>Java Odd Even Program using OOPs:</u>

In this program, we are dividing the code using the Object-Oriented Programming.

```java
package SimpleNumberPrograms;


public class EvenOrOdd {

    int x;


    public void evenOrOdd() {

        if (x % 2 == 0) {

            System.out.println("\n You have entered EVEN Number");

        }

        else {

            System.out.println("\n You have entered ODD Number");

        }

    }

    public int evenOrOddAgain(int Number) {

        if (Number % 2 == 0) {

            return 1;

        }

        else {

            return 0;

        }

    }

}
```

Output:

Please Enter the integer Value to check Even or Odd:

45

You have entered ODD Number

Question 2

Answer:

Java program of addition and subtraction of two Complex Numbers

```java
import java.util.Scanner;

/*
 * Java Program to add and subtract two complex numbers
 * This program will calculate sum and difference of two
 * given a complex number in Java.
 */
public class Main {

  public static void main(String[] args) {

    // first complex number
    ComplexNumber c1 = new ComplexNumber(2, 4);
    ComplexNumber c2 = new ComplexNumber(3, 5);

    ComplexNumber sum = c1.sum(c2);
    ComplexNumber difference = c1.difference(c2);

    System.out.println("first complex number: " + c1);
    System.out.println("second complex number: " + c2);
```

```java
      System.out.println("sum of two complex numbers: " + sum);

      System.out.println("difference of two complex numbers: " + difference);


  }
}


/*
 * A class to represent a complex number. A complex number has two parts, real
 * and imaginary. Make this class Immutable as it's a value class.
 */
class ComplexNumber {
  private final double real;
  private final double imaginary;

  public ComplexNumber(double real, double imaginary) {
    this.real = real;
    this.imaginary = imaginary;
  }

  public ComplexNumber sum(ComplexNumber other) {
    double r = this.real + other.real;
    double i = this.imaginary + other.imaginary;
    return new ComplexNumber(r, i);
  }

  public ComplexNumber difference(ComplexNumber other) {
    double r = this.real - other.real;
    double i = this.imaginary - other.imaginary;
```

```java
    return new ComplexNumber(r, i);

  }


  public double getReal() {

    return real;

  }


  public double getImaginary() {

    return imaginary;

  }


  @Override

  public String toString() {

    return real + " + " + imaginary + "i";

  }


}
```

Output:

first complex number: 2.0 + 4.0i

second complex number: 3.0 + 5.0i

sum of two complex numbers: 5.0 + 9.0i

difference of two complex numbers: -1.0 + -1.0i

Question 3

Answer:

Java Leap Year Program using Oops

This program for java leap year allows entering any positive integer (year). Then the Java program checks whether the given year is a leap year or not. In this example, we are dividing the code using the Object-Oriented Programming.

To do this, first, we will create a class that holds a method to reverse an integer recursively.

package DatePrograms;

```java
public class LeapYear {

    public int CheckLeapYear(int year) {

        if (( year%400 == 0)|| (( year%4 == 0 ) && ( year%100 != 0))) {

            return year;

        }
        else {

            return 0;

        }

    }

}
```

Within the Main program of the leap year program in java, we will create an instance of the above-specified class and call the methods.

package DatePrograms;

import java.util.Scanner;

```java
public class LeapYearUsingClass {

    private static Scanner sc;

    public static void main(String[] args) {

        int year, leap;

        sc = new Scanner(System.in);

        System.out.println(" Please Enter any year you wish: ");
```

```java
            year = sc.nextInt();


            LeapYear ly = new LeapYear();

            leap = ly.CheckLeapYear(year);


            if(leap != 0) {

                    System.out.format("\n %d is a Leap Year. \n", year);

            }

            else {

                    System.out.format("\n %d is NOT a Leap Year. \n", year);

            }

        }

}
```

Output:

Please Enter any year you wish:

2032

2032 is a Leap Year

Question 4

Answer:

Using loop and or operator verify whether given character is 'a' or 'e' or 'i' or 'o' or 'u' else it is consonant.

```java
import java.util.Scanner;

public class VowelOrConsonant {

  public static void main(String args[]){

    System.out.println("Enter a character :");

    Scanner sc = new Scanner(System.in);

    char ch = sc.next().charAt(0);

    if(ch == 'a'|| ch == 'e'|| ch == 'i' ||ch == 'o' ||ch == 'u'||ch == ' '){
```

```
        System.out.println("Given character is an vowel");
    }else{
        System.out.println("Given character is a consonant");
    }
  }
}
```

Output:

Enter a character :

a

Given character is an vowel

Enter a character :

l

Given character is a consonant

Question 5

Answer: