INTI International College Penang

FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**April 2020**
Programme	:	Diploma in Electrical & Electronic Engineering (DEEI)
Course	:	**CSC2181: Object-Oriented Programming In Java**
Date of Examination	:	3 August 2020 (Monday)
Time	:	8.00am – 11.00am Reading Time : Nil
Duration	:	3 Hours

Special Instructions :

This paper consists of **FOUR (4)** questions. Answer **ALL** questions in the answer booklet provided.
All questions carry equal marks.

Material permitted :
Non-Programmable Scientific Calculator

Materials provided :
Nil

Examiner(s)	:	**Ms Nadhrah Abdul Hadi**
Chief Moderator	:	Ms Chern Huey Rong

*This paper consists of **5** printed pages, including the cover page*

INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN ELECTRICAL & ELECTRONIC ENGINEERING PROGRAMME (DEEI)
CSC2181: OBJECT-ORIENTED PROGRAMMING IN JAVA
FINAL ALTERNATIVE ASSESSMENT: APRIL 2020 SESSION

Instruction: This paper consists of **FOUR (4)** questions. Answer **ALL** questions in the answer booklet provided. All questions carry equal marks.

Question 1

a) Consider the following statements:

String oop = "Object Oriented Programming in Java.";

Analyze and trace the results of the following expressions:

i. `System.out.println(oop.substring(16,27));`

ii. `System.out.println(oop.substring(31,35));`

iii. `System.out.println(oop.toUpperCase());`

iv. `System.out.println(oop.toLowerCase());`

v. `System.out.println(oop.replace('m', '*'));`

(5 marks)

b) Consider the following classes definition:

```
class Calculation {
      int c;

      public void addition(int a, int b) {
            // Operation: value of c is the sum of a and b
            // Output the value of c
      }

       public void subtraction(int a, int b) {
            // Operation: value of c is the difference between a and b
            // Output the value of c
      }
}
```

```
public class My_Calculation extends Calculation {

      public void multiplication(int a, int b) {
      // Operation: value of c is the product of a and b
      // Output the value of c
   }

   public static void main(String args[]) {
      int x = 30, y = 20;

      // Create a myCalc object
      // Call the addition() method on the myCalc object
      // Call the subtraction() method on the myCalc object
      // Call multiplication() method on the myCalc object

   }
}
```

i. Write the definition of the method `addition()` and `subtraction()` of the class `Calculation` as described in the class definition.

(4 marks)

ii. Write the definition of the method `multiplication()` and `main()` method of the class `My_Calculation` as described in the class definition.

(6 marks)

c) Given an array of integer that stored five numbers; 20, 30, 40, 50 and 60. Write a full program to calculate and display the average value of the array elements.

(10 marks)

Question 2

a) Based on the following program, you need to write a Java method named `numberOfVowels()` to count all vowels in a string that is entered by the user.

```
public static void main(String[] args)
    {
        Scanner input = new Scanner(System.in);
        System.out.print("Input the string: ");
        String str = input.nextLine();

          System.out.print("Number of Vowels in the string: " +
          numberOfVowels(str)+"\n");
    }
```

(15 marks)

b) Based on the following program, you need to write two methods. The first method is `showSum()` that will calculate and print the sum of the two numbers. The second method is `showProduct()` that will calculate and print the product of the two numbers.

```
public static void main(String[] args){
    double a = 5.6;
    double b = 7.5;

    showSum(a, b);
    showProduct(a, b);
}
```

(10 marks)

Question 3

Create an inheritance hierarchy of **Bird**: **Ostrich** and **Penguin**. In the base class, provide two methods that are common to all **Bird**s, and override these in the derived classes to perform different behaviors depending on the specific type of **Bird**. In main method, create an array of **Bird**, fill it with different specific types of **Bird**s, and call the base class methods.

(25 marks)

Question 4

a) Write a program that prompts user to enter a number in the range of 1 to 10. If the number entered by the user is correct, displays "The number is valid". Otherwise, displays "The number is invalid" and prompts the user to enter a number again.

(10 marks)

b) Convert the UML Diagram below to code.

Rectangle
- width : double - length : double
+ setWidth(w : double) : void + setLength(len : double): void + getWidth() : double + getLength() : double + getArea() : double

(15 marks)

~ The End ~

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