INTI International College Penang

FINAL
Examination Paper

(COVER PAGE)

Session	:	**April 2019**
Programme	:	Diploma in Electrical and Electronic Engineering (DEEI)
Course	:	**CSC2181: Object-Oriented Programming in Java**
Date of Examination	:	28 July 2019 (Sunday)
Time	:	11:00am – 1:00pm
Duration	:	2 hours Reading Time : Nil
Special Instructions	:	

This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet.

IMPORTANT NOTE : THIS PAPER SHOULD NOT BE TAKEN OUT OF THE EXAMINATION HALL

Materials Permitted :
Non-Programmable Scientific Calculator

Materials Provided :
Nil

Examiner(s)	:	**Ms. Usha A/P Jayahkudy**
Moderator	:	Dr. Vincent Khoo

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

INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING (DEEI)
CSC2181: OBJECT-ORIENTED PROGRAMMING IN JAVA
FINAL EXAMINATIONS: APRIL 2019 SESSION

Instruction: This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

(a) Design an algorithm by using flow chart that will prompt for, receive and total a collection of payroll amounts entered at the terminal until a sentinel amount of -999 is entered. After the sentinel has been entered, display the total payroll amount to the screen. (14 marks)

(b) An admission charge for The Little Penguin Theater varies according to the age of the person. Design a pseudocode algorithm that prompts the user to input the age of a person and output the ticket charged by the given age of the person. The charges are as follows:

- 55 and above: RM 10
- 21-54: RM 15
- 13-20: RM 10
- 3-12: RM 5
- 3 and below: Free (11 marks)

Question 2

(a) Briefly explain two advantages of Object-oriented programming over Procedure-oriented programming language. (4 marks)

(b) Briefly explain the term **polymorphism** in object-oriented terminology. (4 marks)

(c) Briefly explain the term **Class** in object-oriented terminology. (2 marks)

(d) Write a Java statement to print the integers from 1 to 20 using a while loop and the counter variable *m*. Assume that the variable *m* has been declared, but not initialized. Print only five integers per line. (5 marks)

(e) Write the full Java program to compute the sum of the digits of an integer. (10 marks)
Below is sample output:

```
run:
Input an integer: 2389
The sum of the digits is: 22
BUILD SUCCESSFUL (total time: 6 seconds)
```

Question 3

(a) Create a class called Invoice that a hardware store might use to represent an invoice for an item sold at the store. An Invoice should include four pieces of information as instance variables-a part number(type String),a part description(type String), a quantity of the item being purchased(type int) and a price per item(double). Your class should have a constructor that initializes the four instance variables. Provide a set and a get method for each instance variable. In addition, provide a method named `getInvoiceAmount` that calculates the invoice amount (i.e., multiplies the quantity by the price per item), then returns the amount as a double value. If the quantity is not positive, it should be set to 0. If the price per item is not positive, it should be set to 0.0. Write an application named `InvoiceTest` that demonstrates class Invoice's capabilities.

(15 marks)

(b) With the aid of a diagram, explain the relationship between Java Virtual Machine, Java Runtime Environment and Java Design Kit. (10 marks)

Question 4

(a) Explain **FIVE** characteristics of a constructor. (10 marks)

(b) There are some errors on the code below. Explain how to correct the errors.

i. (2 marks)

```
void g()
{
 System.out.println("Inside method g");

  void h()
  {
    System.out.println("Inside method h");
  }
}
```

ii. (2 marks)

```
int sum(int x, int y)
{
   int result;
   result = x + y;
}
```

iii. (2 marks)

```
void f(float a);
{
   float a;
   System.out.println(a);
}
```

iv. (2 marks)

```
void product()
{
    int a = 6, b=5, c=4, result;
    result = a*b*c;
    System.out.printf("Result is %d%n", result);
    return result;
}
```

(c) Write a method with the following method header: (7 marks)

```
public static int gcd(int num1, int num2)
```

For example, gcd(12, 16) returns 4. Write a program that prompts the user to enter two integers and compute the gcd of the two integers.

Question 5

(a) Create a class named Stock that contains:

- A string data field named symbol for the stock's symbol.
- A string data field name for the stock's name.
- A double data field named previousClosingPrice that stores the stock price for the current time
- A constructor that creates a stock with the specified symbol and name.
- A method named `getChangePercent()` that returns the percentage changed from previousClosingPrice to currentPrice.

Write a program that creates the Stock object with the stock symbol OCRL, the name as Oracle Corporation, and the previous closing price of 34.5. Set a new current price to 34.5 and display the price-change percentage. (15 marks)

(b) Write the following method that returns the multiplication of all numbers in an ArrayList:

```
public static double multiply(ArrayList<Double> List)
```

The program should prompt the user to enter 5 numbers, stores them in an array list, display their product. (10 marks)

Question 6

(a) Write a program that prompts the user to read two integers and display their product. The program should prompt the user to read the number again if the input is incorrect. (8 marks)

(b) Describes the differences between a while loop and a do-while loop. Convert the below while loop into a do-while loop. (8 marks)

```
Scanner input = new Scanner(System.in);
int sum = 0;
System.out.println("Enter an integer" + "(the input ends if it is
                   0)");
int number = input.nextInt()
while (number != 0)
{
  sum += number;
  System.out.printl("Enter an integer" + "(the input ends if it is
                    0)");
  number = input.nextInt();

}
```

(c) Identify the error in the following code:

```
ArrayList<String> list = new ArrayList<>();
list.add("Denver");
list.add("Austin");
list.add(new java.util.Date());
String city = list.get(0);
List.set(3, "Dallas");
System.out.println(list.get(3));
```

(6 marks)

(d) State the type of error for the following scenario:

i. Forget to put a closing quotation mark on a string within the Java code. (1 mark)

ii. The program needs to read integers, but the user entered strings, an error would occur when running this program. (1 mark)

iii. Suppose the program written to compute the perimeter of a rectangle and you mistakenly write your program so that it computes the area of a rectangle. (1 mark)

~ The End ~