



FINAL
Examination Paper

(COVER PAGE)

Session : August 2018

Programme : Diploma in Electrical and Electronic Engineering (DEEI)

Course : CSC2181: Object-Oriented Programming in Java

Date of Examination : 7 December 2018 (Friday)

Time : 2:00pm – 4:00pm

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. Norashida binti Sabari

Moderator : Dr. Vincent Khoo

This paper consists of 6 printed pages, including the cover page.

INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING (DEEI)
 CSC 2181: OBJECT-ORIENTED PROGRAMMING
 FINAL EXAMINATIONS: AUGUST 2018 SESSION

Instructions: 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) List **FIVE (5)** Java reserved keywords. (5 marks)
- (b) Identify and correct the errors in each of the following statements:
- i. `if (c < 7);`
`System.out.println("c is less than 7");` (2 marks)
 - ii. `if (c => 7)`
`System.out.println("c is equal to or greater than 7");` (2 marks)
 - iii. `while (c <= 5)`
`{`
`product *= c;`
`++c;` (2 marks)
 - iv. `if (gender == 1)`
`System.out.println("Woman");`
`else;`
`System.out.println("Man");` (2 marks)
 - v. `for (k = 0.1; k != 1.0; k += 0.1)`
`System.out.println(k);` (2 marks)
- (c) Write a Java program to compute an electricity bill. Your program should prompt the user for the number of kilowatt-hours (kWh) of electricity used, calculate the amount owed, and output a report.

The amount owed should consist of a standing charge of RM5.50 together with the cost of electricity, calculated at the rate of 7 pence per kWh.

The generated report should EXACTLY follow the format below, including a blank line prior to the ELECTRICITY BILL line. All capitalization, blank lines, spacing, and

punctuation must appear as indicated; only the numbers should differ so as to reflect the number of kWh entered.

```
ELECTRICITY BILL
Usage:          100 kWh
Standing Charge: 5.50
Electricity Cost: 7.0
Total:          12.50
```

(10 marks)

Question 2

- (a) Determine whether each of the following is true or false. If false, explain why.
- i. An array can store many different types of values.
 - ii. An array index should normally be of type float.
 - iii. Command-line arguments are separated by commas.
- (6 marks)
- (b) Write **FOUR (4)** different Java statements that each add 1 to integer variable x.
- (4 marks)
- (c) Design a class named Account that contains:
- i. A private int data field named id for the account (default 0).
 - ii. A private double data field named balance for the account (default 0).
 - iii. A private double data field named annualInterestRate that stores the current interest rate (default 0). Assume all accounts have the same interest rate.
 - iv. A private Date data field named dateCreated that stores the date when the account was created.
 - v. A no-arg constructor that creates a default account.
 - vi. A constructor that creates an account with the specified id and initial balance.
 - vii. The accessor and mutator methods for id, balance, and annualInterestRate.
 - viii. The accessor method for dateCreated.
 - ix. A method named getMonthlyInterestRate() that returns the monthly interest rate.
 - x. A method named getMonthlyInterest() that returns the monthly interest.
 - xi. A method named withdraw that withdraws a specified amount from the account.
 - xii. A method named deposit that deposits a specified amount to the account.

Write a test program that creates an Account object with an account ID of 1222, a balance of RM20,000, and an annual interest rate of 4.5%. Use the withdraw method to withdraw RM2,500, use the deposit method to deposit RM3,000, and print the balance, the monthly interest, and the date when this account was created.

(15 marks)

Question 3

- (a) Write declarations, statements or comments that accomplish the tasks of calculating the product of three integers.
- i. Create a Scanner called input that reads values from the standard input.
 - ii. Declare the variables x,y,z and result to be of type int.
 - iii. Prompt the user to enter the first integer.
 - iv. Read the first integer from the user and store it in the variable x.
 - v. Prompt the user to enter the second integer.
 - vi. Read the second integer from the user and store it in the variable y.
 - vii. Prompt the user to enter the third integer.
 - viii. Read the third integer from the user and store it in the variable z.
 - ix. Compute the product of the three integers contained in variables x, y and z, and assign the result to the variable result.
 - x. Use System.out.printf to display the message “Product is” followed by the value of the variable result.
- (10 marks)
- (b) Write a program that prompts the user to enter a letter and check whether the letter is a vowel or consonant.
- (10 marks)
- (c) List **FIVE (5)** common examples of exceptions.
- (5 marks)

Question 4

- (a) Suppose s1, s2 and s3 are three strings, given as follows:

```
String s1 = "Welcome to Java";
String s2 = "Programming is fun";
String s3 = "Welcome to Java";
```

Analyze and trace the results of the following expressions:

- i. s1 == s2
- ii. s1.equals(s2)
- iii. s1.compareTo(s2)
- iv. s2.compareTo(s2)
- v. s1.indexOf('j')
- vi. s1.lastIndexOf('a')
- vii. s1.length()
- viii. s1.substring(5,11)
- ix. s1.endsWith("Java")
- x. s1.toUpperCase()

- (b) Write a program that randomly generates an integer between 1 and 12 and displays the English month name January, February, ..., December for the number 1, 2, ..., 12 accordingly. (10 marks)
- (c) Explain the terms below: (6 marks)
- i. Inheritance
 - ii. Polymorphism
 - iii. Interfaces
- (9 marks)

Question 5

- (a) Suppose the tuition for a university is RM10,000 this year and increases 5% every year. In one year, the tuition will be RM10,500. Write a Java program that computes the tuition in ten years and the total costs of four years' worth of tuition after the tenth year. (10 marks)

- (b) Write a method that finds the smallest element in an array of double values using the following header:

```
public static double min(double[] array)
```

Write a test program that prompts the user to enter ten numbers, invokes the method to return the minimum value, and displays the minimum value. Here is a sample run of the program:

```
Enter 10 number: 1.9 2.5 3.7 2 1.5 6 3 4 5 2
The minimum number is: 1.50
```

- (c) Analyze and trace the output of the following code: (10 marks)

```
public class Test {
    public static void main(String[] args){
        for(int count = 1; count <= 10; count ++){
            {
                if(count == 5)
                    continue;

                System.out.printf("%d", count);
            }
            System.out.printf("\nUsed continue to skip printing 5%n");
        }
    }
}
```

(5 marks)

Question 6

- (a) Write a method with the following header to display three numbers in increasing order:

```
public static void displaySortedNumbers(double num1, double num2, double num3)
```

Write a test program that prompts the user to enter three numbers, and invokes the method to display them in increasing order.

(10 marks)

- (b) Design a class named Stopwatch. The class contains:

- i. Private data fields `startTime` and `endTime` with getter methods.
- ii. A no-arg constructor that initializes `startTime` with the current time.
- iii. A method named `start()` that resets the `startTime` to the current time.
- iv. A method named `stop()` that sets the `endTime` to the current time.
- v. A method named `getElapsedTime()` that returns the elapsed time for the stopwatch in milliseconds.

Write a test program that measures the execution time of sorting 100,000 numbers using selection sort.

(15 marks)

~ The End ~
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