INTI International University & Colleges

FINAL
Examination Paper

(COVER PAGE)

Session	:	April 2016
Programme	:	Diploma In Information And Communication Technology (DICTN) Diploma in Information Technology (DITI)
Course	:	**ICT2100/CSC2100: Object Oriented Programming**
Date of Examination	:	28 July, 2016 (Thursday)
Time	:	11:00am – 1:00pm Reading Time : Nil
Duration	:	2 Hours

Special Instructions :

Answer any **FOUR (4)** questions in the answer booklet provided.

Materials permitted :
Non-programmable Calculator

Materials provided :
Nil

Examiner(s)	:	**Ng Ruoh Ling** and Lai Kim Min
Moderator	:	Siti Hawa Mohamed Said

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

DIPLOMA IN COMPUTING AND INFORMATION TECHNOLOGY (DICTN)
DIPLOMA IN INFORMATION TECHNOLOGY (DITI)
ICT2100/CSC2100: OBJECT-ORIENTED PROGRAMMING
FINAL EXAMINATION: APRIL 2016 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) Write a method that would accept two integers and return their product. You are not allowed to use multiplication operator.

(6 marks)

(b) What does the following program print?

```
class Q1b{
    public static void main(String arg[]){
        int i = 1;
        while (i <= 3) {
            int num = 1;
            for (int j = 1; j <= i; j++) {
              System.out.print(num + "bb");
              num *= 3;
            }
            System.out.println();
            i++;
         }
    }
}
```

(6 marks)

(c) Write a complete Java program that prompts the user for a series of numbers to determine the smallest value entered. Before the program terminates, display the smallest value. The samples of program output are shown below:

```
This program finds the smallest numbers in a series of inputs
When you want to exit, type Q
Enter a number: 10
Enter a number: 6
Enter a number: -6
Enter a number: 1
Enter a number: Q
The smallest number is: -6
```

```
This program finds the smallest numbers in a series of inputs
When you want to exit, type Q
Enter a number: Q
There is no value entered.
```

(13 marks)

QUESTION 2

(a) Write a program that declares an array of `int` for 100 integers. The program then randomly generates 100 integers between 0 and 1000 and store them in the array. The program then display all the integers that are the multiplication of integer 6. (For example: 12, 24, 108, and 48 are all multiplication of 6)

(8 marks)

(b) (i) Define an exception class `DangerException` and inherit it from `RuntimeException`. The class has an attribute named `message` of type `String`. It has a constructor that takes a single parameter named `level`, type `int`. The `message` is assigned based on the danger `level` as below:

level	**Message**
1 to 3	Danger level is low
4 to 6	Danger level is medium
7 to 8	Danger level is high
9 to 10	Danger level is very high

The class overrides the `getMessage` method by returning the `message`.

(10 marks)

(ii) Write a code segment to throw the `DangerException` by reading a danger `level` between 1 and 10 from the user. Provide the proper block to handle the exception and print the `message`.

(7 marks)

QUESTION 3

(a) Create an `Alien` class with the following details:

- A private instance attribute called `strength`
- A default constructor to set `strength` a value.
- Mutator and accessor methods for attribute `strength`

(8 marks)

(b) With regards to question 3(a), create a class named `Game`, that creates an array of 100 `Aliens` and assign a random value between 50 and 100 to the attribute `strength` through the constructor. The program then displays all the `strength` of each `Alien` (`Alien` 1 to `Alien` 100).

(8 marks)

(c) Differentiate between:

(i) Overriding method and overloading method
(ii) Class member and object member
(iii) Accessor and mutator of a private attribute

(9 marks)

QUESTION 4

(a) Given the following program and output:

```
public class PetClient {
    public static void main(String arg[])
    {
        Pet cat = new Pet("Tom", "cat", 4);
        Pet dog = new Pet ("Spike", "dog", 5);
        Pet hamster = new Pet("Micy","hamster",2);
        System.out.println(cat.toString());
        System.out.println(dog.toString());
        System.out.println(hamster.toString());
    }
}
```

```
Output - Final (run)   run.xml
run:
Pet : Tom, cat,4 months, price RM120.0
Pet : Spike, dog,5 months, price RM150.0
Pet : Micy, hamster,2 months, price RM60.0
BUILD SUCCESSFUL (total time: 0 seconds)
```

Write the class `Pet` that has the attributes, constructor and toString members that allows such object instantiation. Include also a method named `price` that will return the price of a pet based on its age as shown below:

Species	**Less than 12 months**	**>= 12 months**
Cat	120	180
Dog	150	250
Hamster	80	130

(15 marks)

(b) State an appropriate method to perform the following tasks:

(i) To find the occurrence of a searched string and return its position.
(ii) To convert string to float value.
(iii) To convert a character to uppercase form.

(6 marks)

(c) A car dealer company is preparing an annual sales reporting. The manager would like to know the quantity of cars sold in every month for each of the brand they sell. The brands include Mercedes, Honda, BMW, Mazda, Peugeot and Lexus. Declare the array that can store the data for each of the following:

(i) the names of all the months (Jan to Dec)
(ii) all the car brands
(iii) the quantity sold for each month for each brand
(iv) the total quantity sold for the year for each brand

(4 marks)

QUESTION 5

(a) Given the following interface:

```
public interface Scholarship {
    public abstract boolean isQualified();
}
```

(i) A class named `Program` implements the interface `Scholarship`. The class `Program` has a private attribute named `cgpa` (`float`) and the attribute's accessor and mutator. It has a constructor that takes the `cgpa` data for initialization. The class `Program` does not provide the implementation of the method `isQualified`. Write the code for class `Program`.

(10 marks)

(ii) A class named `DiplomaProgram` is the child class of class `Program`. The child class has a constructor that takes the `cgpa` for initialization. The class provides the implementation of the method `isQualified` by returning `true` if the `cgpa` is greater than or equal to 3.5. Write the code for the class.

(7 marks)

(b) Write a method that takes 2 integers, `x` and `y` through its parameters. Using suitable Math's methods, the method then displays the following:

(i) `x` exponent `y`
(ii) A random integer between `x` and `y`
(iii) The bigger value between `x` and `y`

(8 marks)

QUESTION 6

(a) Write a program that reads two words, the program then compares and displays if the two words

(i) are the same word (without considering the case used)
(ii) start with the same letter (without considering the case used)
(iii) both contain letter 'e'

(10 marks)

(b) Trace the output of the following program:

```
public class Q6b {
    public static void main(String arg[])
    {       loop(6);
    }
    public static void loop(int n)
    {
        System.out.println(n--);
        if(n>1) loop(n-2);
        System.out.println(--n);
    }
}
```

(6 marks)

(c) Given the following code:

```
int result = 50 / 0;
int celcius = Integer.parseInt("37a") + 23;
```

(i) What are the two possible exceptions that may occur?

(2 marks)

(ii) Rewrite the code with exception statements that can detect, handle the errors and print the error message out.

(7 marks)

~ The End ~