FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**April 2020**
Programme	:	Diploma In Information And Communication Technology (DICTN) Diploma In Information And Technology (DITN)
Course	:	**ICT2100: Object Oriented Programming**
Date of Examination	:	August 4, 2020 (Tuesday)
Time	:	12.00noon – 2.30pm Reading Time : Nil
Duration	:	2 Hours : 30 Minutes

Special Instructions :

SECTION A: Answer **ALL FOUR (4)** questions.

SECTION B: Answer **ALL THREE (3)** questions.

Materials permitted :

Non-programmable Calculator

Materials provided :

Nil

Examiner(s)	:	**Ng Ruoh Ling**, Nor Athirah Azlan and Lai Kim Min
Chief Moderator	:	Siti Hajar

*This paper consists of **7** printed pages, including the cover page*

DIPLOMA IN COMMUNICATION AND INFORMATION TECHNOLOGY PROGRAMME (DICTN)
DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME (DITN)
ICT2100 : OBJECT-ORIENTED PROGRAMMING
FINAL ALTERNATIVE ASSESSMENT: APRIL 2020 SESSION

Instruction: This paper consists of **SEVEN (7)** questions. Answer **ALL** questions in your own writing pad.

SECTION A (40%)

Question 1

(a) Assuming you have an *int* variable called `number` with initial value `1856`. Write Java output statement(s) to display the number one digit per line in reverse order. You are not allowed to convert the variable into String or char. Use the division and modulus operators to extract the digits accordingly. The output should be as below:

```
6
5
8
1
```

(4 marks)

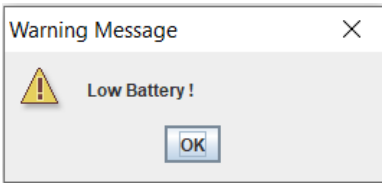
(b) Assuming necessary packages have been imported, write a Java statement to perform each of the following tasks:

(i) Use an input dialog box to read a tax value from the user and store the value into a *double* variable called `tax`.

(ii) Print the words "Object Oriented Programming in Java" one word per line using only a single print statement with escape sequences to get the output below:

```
Object
        Oriented
Programming
        in
Java
```

(iii) Display a message dialog box as shown below:



(6 marks)
(Total: 10 marks)

Question 2

(a) Given the following program:

```
import java.util.Scanner;
public class Fq2a {
    public static void main(String [] args){
        Scanner scan=new Scanner(System.in);
        String word;
        System.out.print("Enter a word :");
        word=scan.next();
        //your code
    }
}
```

Complete the above program (provide only the missing code) to display the number of characters in the word. If the word ends with a vowel (a, e, i, o, or u, accept both uppercase and lowercase), display a random integer between -10 and 0. If the word ends with a consonant, display a random integer between 1 and 100 which is a multiplication of 3 (3, 6, 9, 12, 15, ... , 96, 99). Otherwise, display the message "The word does not end with a letter". Below show 3 different results of your program:

Example 1:
Enter a word: exam
The number of characters is 4
63

Example 2:
Enter a word: SMILE
The number of characters is 5
-4

Example 3:
Enter a word: Exam!
The number of characters is 5
The word does not end with a letter

(10 marks)

Question 3

Write the code inside the main method that will repeatedly read in positive integers from the user until a zero or a negative value is entered to end the reading. The program then calculates and displays the total and average of all the positive integers. If no positive integer is entered, the program displays "No input for calculation". Provide only the code inside the main method. Below show 2 output examples of your program:

Example 1:
Enter a number (0 or negative to exit): 10
Enter a number (0 or negative to exit): 5
Enter a number (0 or negative to exit): 9
Enter a number (0 or negative to exit): -3
The total is: 24
The average is 8.0

Example 2:
Enter a number (0 or negative to exit): 0
No input for calculation

(10 marks)

Question 4

Write a fragment of code to perform the following tasks:

(a) Declare an *int* array called `list` with the default values [10, 20, 30, 40, 50, 60].

(1 mark)

(b) Declared another *int* array called `copyList` with the same array size of `list` and copy the data from `list` to `copyList`.

(3 marks)

(c) Using the same loop, multiply the 1st, 3rd and 5th elements by 2 and 2nd, 4th and 6th elements by 3 in the `copyList` so that the data in `copyList` will be [20, 60, 60, 120, 100, 180].

(6 marks)

(Total: 10 marks)

SECTION B (60%)

Question 5

(a) Given the following program:

```
public class Virus {
    private static int count = 0;
    String name;
    private float deathRatePercent;
}
```

(i) Suggest 2 ways to initialize only the attribute `deathRatePercent`. Provide the code for the solutions.

(6 marks)

(ii) Based on the code added to the program from (i), declare a `Virus` object called `newVirus` and set its `name` to "Covid-19" and its `deathRatePercent` to 2.

(3 marks)

(iii) Define a public method that will increase the variable `count` by 1 each time the method is invoked.

(2 marks)

(iv) With the method defined in (iii), write a statement that will increase the `count` by 1.

(1 mark)

(b) Given the following program:

```
import java.util.Scanner;
public class Patient {
    public static void main(String []arg)
    {
        Scanner scan=new Scanner(System.in);
        String name,output="";
        int urgencyLevel;
        System.out.print("Enter patient name :");
        name=scan.nextLine();
        System.out.print("Enter urgency level(1-3) :");
        urgencyLevel=scan.nextInt();
    }
}
```

Rewrite the method body to create a try and catch block to validate user input. Handle the error if the input for urgency level is not an integer. Throw appropriate exception with proper error message if the input for urgency level is not between 1 and 3

(8 marks)

(Total 20 marks)

Question 6

Given the following class:

```
public abstract class Drink {
    protected int ml;
    protected String packaging;
    protected String flavor;
    public Drink(int ml, String packaging, String flavor)    {
        this.ml=ml;
        this.packaging=packaging;
        this.flavor=flavor;
    }
    public abstract boolean isHealty();
    public String toString(){
        return "Flavor: " + flavor + "\nML: "+ml +
                "\nPackaging: " + packaging;
    }
}
```

(a) Create a first child class named `CanCoffee` with the following members:

- Private object attribute `caffeineMg` (int)
- Constructor that takes the data for `caffeineMg` initialization and assign 350, "Can" and "Coffee" to other attributes.
- An overriding method `isHealthy` that returns true if caffeine mg is lower or equal to 300, returns false otherwise.
- An overriding `toString` method that returns all the attributes data by accessing its own private attribute and parent's class `toString` method.

(7 marks)

(b) Create a second child class named `BottleCocaCola` with the following members:

- Private object attribute `sugarGram` (int)
- Constructor that takes the data for `sugarGram` initialization and assign 500, "Bottle" and "Coca Cola" to other attributes.
- An overriding method `isHealthy` that returns true if sugar gram is lower or equal to 25, returns false otherwise.
- An overriding `toString` method that returns all the attributes data by accessing its own private attribute and parent's class `toString` method.

(7 marks)

(c) Declare an array of Drink that has the following objects and data:

CanCoffee	150 mg of caffein
CanCoffee	350 mg of caffein
BottleCocaCola	40 gram of sugar
BottleCocaCola	10 gram of sugar

(2 marks)

(d) With the array created in question (iii), write a loop statement that prints all the attributes of each array element and also if the drink is healthy or not healthy

(4 marks)

(Total: 20 marks)

Question 7

Write code for the followings:

(a) An interface called `DocumentListener` that has a single abstract method called `print()`.

(2 marks)

(b) An abstract class called `Document` with the following information:

- An object variable called `content` as *String* type. The variables can be accessed by the descendant(child) classes.
- A parameterized constructor

(4 marks)

(c) A concrete class called `HTMLDocument` that derives from Document class and implements `DocumentListener` interface. The class has the following information:

- Instance variable called `version` (*double*)
- A default constructor that initializes default values of `version` and `content` to 5.0 and "<HTML><BODY>".
- A method named `addToBody` with String parameter. The method appends the String it receives to `content` in a new line.
- Overriding `print` method where the method prints the data of `content`

(9 marks)

(d) Write a fragment of code to perform the following tasks:

- Declare a `HTMLDocument` object called `aPage`
- Add data to attribute `content` of `aPage` and print the `content` where the output of `content` will be as follows:
  <HTML><BODY>
  <P>Java is fun!</P>
  </BODY></HTML>

(5 marks)

(Total: 20 marks)

~ The End ~

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