FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**April 2022**
Programme	:	Diploma In Computer Science (DCS) Diploma In Information Technology (DITN) Diploma In Electrical And Electronic Engineering (DEEI)
Course	:	**ICT2113: Object-Oriented Programming/** **CSC2181: Object-Oriented Programming In Java**
Date of Examination	:	01 August 2022(Monday)
Time	:	04.00pm-06.30pm Reading Time : Nil
Duration	:	2 Hours 30 Minutes

Note: 30 minutes is added into the duration of the examination to factor in any connectivity matters and for you to scan and upload your scripts

Special Instructions :

This paper consists of **TWO (2)** sections. Answer **ALL** questions in your own writing pad.

Material permitted : Non-Programmable Scientific Calculator

Materials provided : Nil

Examiner(s)	:	**Lai Kim Min**, Ng Ruoh Ling
Chief Moderator	:	Shee Fui Shie

*This paper consists of **4** printed pages, including the cover page*

DIPLOMA IN COMPUTER SCIENCE PROGRAMME (DCS)
DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME (DITN)
DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING PROGRAMME (DEEI)
ICT2113: OBJECT-ORIENTED PROGRAMMING
CSC2181: OBJECT-ORIENTED PROGRAMMING IN JAVA
FINAL ALTERNATIVE ASSESSMENT: APRIL 2022 SESSION

Instruction: This paper consists of **TWO (2)** sections. Answer **ALL** questions in your own writing pad.

SECTION A (50%)

Question 1

(a) For each statement below, state whether the statement is true or false

(i) The precedence of operator `&&` is the same as operator `||`.
(ii) The default value of the integer local variable is 0.
(iii) The `char` type range is from 0 to 65,535.
(iv) In the assignment of `y=x++,` the value of `y` is 11 if the initial value of `x` is 10.
(v) Passing array to a function as an argument is considered as passed by reference.
(vi) Assignment from `char` to `int` is allowed without explicit conversion (casting).
(vii) The following assignment is true: `char letter = '\uFFFF';`
(viii) The return statement can be used without a return value.
(ix) The following if statement is valid: `if (x===3)`
(x) Import statements should be placed before the package statement.

(10 marks)

(b) Write a code fragment to prompt the user to enter the age of the visitor for the concert with the Scanner class. Based on the following table, use the multiple if-else statements to obtain and display the ticket price.

Age	**Price**
5-11	RM 8.00
12-17	RM 15.00
18-49	RM 20.00
Above 49	RM 10.00
Invalid age	RM 0.00

(15 marks)
(Total: 25 marks)

Question 2

(a) Write a program to repeatedly read in integers (negative and positive) from the user and zero (0) to terminate the reading. From the inputs, calculate how many are positive and how many are negative.

(15 marks)

(b) Create the following class method with Java:

(i) Create a method called `checkLastDigit` that receives a String parameter. The method will display the last digit of the parameter.

(ii) Write a method called `sumScores` that receives a double array as scores. This method will return the average of the scores.

(10 marks)

(Total: 25 marks)

SECTION B (50%)

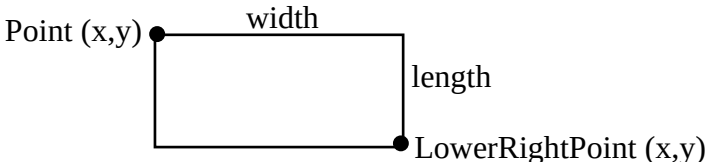
Question 3

(a) Design a class named `Point` with two private attributes `x` and `y` of type int for the coordinates x and y of a point. The class has a `toString` method that returns "Coordinates (4,10)" where 4 and 10 are the attributes x and y.

(4 marks)

(b) Continue from (a), design a class named `Rectangle` with attributes `Point`, `width` and `length`. Create a constructor that receives `x`, `y`, `width` and `length` as parameters to initialize the object. The class has a method named `area` that returns the area of the rectangle object. The formula for area is `width` * `length`.

The class also has a method named `getLowerRightPoint` which returns the coordinates of the lower right point of the rectangle. The lower right coordinate is calculated based on the Point and the width and length. Coordinate x of the lower right point is coordinate x of Point + width. Coordinate y of the lower right point is coordinate x of Point – length.



(14 marks)

(c) Create an array to store the following Rectangle objects which created in part (b):

x	y	width	length
2	10	8	6
20	85	20	12

Write a loop to iterate the array and display the Point's coordinates, area and the coordinates of the lower right corner of the rectangle.

(7 marks)

(Total: 25 marks)

Question 4

(a) Define an interface called `ProductRegisterListener`. This interface should include a void type function called `register` that accepts a String parameter.

(2 marks)

(b) Create an abstract class called `Software`. Include a String attribute called `name` and a double attribute called `version`. Ensure it can be accessed within the class hierarchy. Include a constructor to initialize all the attributes. Create an abstract method named `about`.

(6 marks)

(c) Create a child class called `LicensedSoftware` that inherits from the `Software` and `ProductRegistertListener`. The class should include a private member called `price` as double type. Ensure that this class cannot be sub-classed. Include a constructor to initialize the data members appropriately. Override the `about` method to print out all the software details. Override the `register` method to pass the email address as the parameter and it will print out the following sample output:

```
The software "name" registration details have been sent out
to your user@xxx.com account.
```

(12 marks)

(d) Briefly explain the Polymorphism in object-oriented programming. Use the example of `Software`, `LicensedSoftware` and `Freeware` (assume another new child class) which created in part (b) and (c), and write a code fragment to demonstrate the concept of Polymorphism in software development.

(5 marks)

(Total: 25 marks)

THE END ~