FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**August 2021**
Programme	:	Diploma in Information Technology (DITN) Diploma in Computer Science (DCS) Diploma in Electrical and Electronic Engineering (DEEI)
Course	:	**ICT2113: Object-Oriented Programming** **CSC2181: Object-Oriented Programming in Java**
Date of Examination	:	6 December 2021 (Monday)
Time	:	12.00noon – 2.30pm Reading Time : Nil
Duration	:	2 Hours 30 Minutes

Special Instructions :

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

Material permitted :

Nil

Materials provided :

Nil

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

*This paper consists of **8** 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: AUGUST 2021 SESSION

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

SECTION A (40%)

Question 1

(a) The following program is unable to compile due to several compiling errors. Identify **SIX (6)** syntax errors in the code below.

```
1  public class Question 1a {
2    public static void main(String[] args) {
3
4      int y = 10, z=0;
5      double x;
6      char d = "y";
7      String str;
8
9      str = demo Program;
10     y = 2y;
11     x = 70%;
12     z = x;
13   }
14 }
```

(6 marks)

(b) Given the following declaration:

```
int x=5, y=2;
```

Provide **THREE (3)** `println` statements that will print the following output. Each statement must use the variables `x` and `y`.

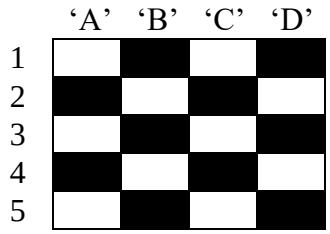
```
7
52
5+2 is 7
```

(4 marks)

(Total: 10 marks)

Question 2

The following board is used to create a simple floor pattern in a game. Each cell is described by a letter and a number.



Write a code fragment to prompt the user to enter a letter ('A', 'B', 'C', 'D') and a number (1 to 5). Use the if statements to get the background color (either black or white) and assign it to a variable called `color`. Display the background color to the user based on the entered letter and number. Assume all the necessary variables have been declared in this program. You are not required to validate the user inputs. Sample output:

```
Enter a letter ('A' to 'D'): B
Enter a number (1 to 5): 4

The background color is White
```

(10 marks)

(Total: 10 marks)

Question 3

Create **THREE (3)** overloading methods that can accept the following method calls:

```
printNumber(4);        //print from 1 to 4
printNumber(2,5);      //print from 2 to 5
printNumber(2,10,2);   //print from 2 to 10 increase by 2
```

and display the following output using the `for` loop:

```
1 2 3 4
2 3 4 5
2 4 6 8 10
```

(10 marks)

(Total: 10 marks)

Question 4

(a) Write a code fragment with the String `getChars` method to move the content of string variable called `name` to a char array called `nameArray`. You are required to create the `nameArray` with the appropriate size.

(4 marks)

(b) Assume you have two different single-dimensional integer arrays called `first` and `second` with distinct lengths. Write a code fragment to switch the contents of two arrays. For example:

Before

first

8	6	0	4	…

second

5	2	7	3	…

After

first

5	2	7	3	…

second

8	6	0	4	…

(6 marks)

(Total: 10 marks)

SECTION B (60%)

Question 5

(a) Create a class called `HairSalon` with the following members:

- A string value to hold the service description (e.g. Cut, Shampoo, Trim, Dye & etc).
- A double value to hold the price of service.
- An integer value to hold the average service time in minutes.
- Include a constructor that requires arguments for all three data fields.
- An accessor method for the price data field.

(8 marks)

(b) Create a driver class called `MySalon`. Create an array to hold two `HairSalon` objects and fill it with the following data:

Service	Price	Service Time
Cut	12.00	10
Trim	69.50	65

(5 marks)

(c) Create a class method in `MySalon` driver class called `findCheapestHairSalon`. This method will receive the `HairSalon` array create in part (b). It will search through the array and return the `HairSalon` object with the cheapest service price.

(7 marks)

(Total: 20 marks)

Question 6

(a) Give the following classes in three different files:

```
1   public class A {
2       public int x=1;
3       protected int y=2;
4       private int z=3;
5       public void display1(){
6           System.out.println("a="+a);
7           System.out.println("b="+b);
8           System.out.println("c="+c);
9       }
10  }
11  public class B extends A{
12      public int a=4;
13      protected int b=5;
14      private int c=6;
15      public void display2(){
16          System.out.println("x="+x);
17          System.out.println("y="+y);
18          System.out.println("z="+z);
19      }
20  }
21  public class Test
22  {
23      public static void main(String[] args) {
24          A obj1=new A();
25          obj1.b++;
26          obj1.z++;
27          B obj2=new B();
28          obj2.a++;
29          obj2.c++;
30          obj2.x++;
31          obj2.y++;
32      }
33  }
```

Identify the errors (use the line number provided) in the program and provide the reasons why the errors occur.

(6 marks)

(b) Given the following child class:

```
public class PremiumUserAccount extends UserAccount{
    private double debitAmount;

   public PremiumUserAccount
        (double da, String name, String email) {
        super(name, email);
        this.debitAmount = da;
  }
  //overriding method
}
```

(i) Create the parent class with proper protected attributes and a constructor.

(5 marks)

(ii) If the following method is inserted into the parent class:

```
public double points(){
    return 0;
}
```

Provide the overriding method in the child class that returns the points which is 100 times the `debitAmount`.

(2 marks)

(iii) Create another child class of `UserAccount` named `SubscribedUsrAccount` with private attribute `subsciptionFees`, parametrized constructor and `points` method that returns 10 times the `subscriptionFees`.

(7 marks)

(Total: 20 marks)

Question 7

(a) Suppose the class `Spaghetti` implements the `Edible` interface and the base class of `Spaghetti` is `Food` class. You have given the following variables declaration:

```
Food food;
Spaghetti spa = new Spaghetti();
Edible e = null;
```

Identify the following statements as valid or invalid.

i) e = spa;
ii) spa = food;
iii) spa = new Food();
iv) food = (Spaghetti) e;
v) e = new Spaghetti();

(5 marks)

(b) Given the following class:

```
class Pet {
   String name;

   Pet(String n) {
       name = n;
   }
   //getter & setter method
}
```

Create a class called `Owner` with the following details:

- An owner name as a string type.
- An object of `Pet` type.
- A constructor to accept the owner's name and pet's name.
- A getter method for the pet object.
- Override the `toString` method to print out both names.
- Override the `equals` method to check the equality of the owner's name and pet's name. Pass a parameter as `Owner` type in this method.

(12 marks)

(c) Based on the `Owner` and `Pet` classes, Write a fragment of code to instantiate an `Owner` object with any names. Then, change the pet name to '`Blacky`'.

(3 marks)

(Total: 20 marks)

~THE END~