**Object-Oriented Programming (OOP, CCIT4023)**

HKU SPACE Community College, 2025-2026

## Assignment 3 (Written)

(15%)

***(Total Marks: 60)***

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**Instructions:**

- **Answer ALL questions in given "Answer Book" with HANDWRITING. Submit only the Answer Book.**
  - Print out the given Answer Book for answering questions with HANDWRITING.

  ** In case students do NOT have printers, they may use A4-size blank/single-line paper(s) with format similar to the given answer book (e.g. draw proper section lines) to answer questions. Clearly indicate the question and section of each answer, with proper sectioning.*
- Use black or dark-blue pen to answer. Make sure answers are well-written for assessment. **TYPING /TABLET/ POOR Writing may NOT be marked!!**
- ***Properly* Scan/take-photo** the finished answer book, **convert it into ONE pdf file**, and **submit the pdf file to SOUL**. Scanned/photo-taken copies (submitted to SOUL) must be **clear enough for printing-out and marking**. You may need to try in different light conditions while taking photos.
- *** IMPORTANT * Collusion and plagiarism** are serious offences. **Zero mark may be given, with possible further disciplinary action**.

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- **Finish this work, based on concepts and techniques learnt in our course. Submitted assessment work based on other non-taught concepts and techniques may be given zero mark or mark penalty.**
- **Students should finish reviewing the related course notes and materials, before doing this assignment.**
- **Individual work: Student MUST FINISH THIS WORK ALONE. Student cannot work with others.**

  ** Plagiarism / Collusion / Shared work with others are not allowed. Zero mark will be given, with possible disciplinary action.*
- Questions related to program codes are based on Java programming language, unless specified.
- Follow given instructions and guidelines.

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**Section A: (20 marks)**

- *Identify the letter of the choice that best completes the statement or answers the question.*
- *Each question carries the same mark.*

**1.** What is the parameter type of the main() method, the entry point of Java program?

A) Array of `String`

B) `void`

C) `static`

D) `String`

**2.** Which of the following will not be inherited from a superclass in Java?

A) Fields

B) Methods

C) Constructors

D) None of the other answers

**3.** Which of the following will be matched last, for matching an identifier inside a method?

A) Local variable

B) Field

C) Parameter

D) None of the other answers

**4.** Given the statement below, which of the following is correct?

```
import ee.dept.Div;
```

A) `ee.dept` is a package.

B) `import` is a keyword.

C) `Div` is not a package.

D) All of the other answers

**5.** Which of the following reserve words is used to call a constructor from another constructor of the same class?

A) `final`

B) `private`

C) `super`

D) `this`

**6.** Which of the following features supports a subclass to reimplement the same method defined in its superclass?

A) Inheritance

B) Encapsulation

C) Overloading

D) Overriding

**7.** Given the valid statement below, which of the following is correct?

```
Pet[] P02 = new Pet[75];
```

A) It creates an object of `Pet` array.

B) It declares and creates an object of `Pet` array.

C) It declares and creates an array of `Pet` array.

D) None of the other answers

**8.** Given the values of `num01` and `num02` are `36` and `6`, respectively. What is the value of the following expression?

```
(num01 % num02 + "6")
```

A) `6`

B) `"06"`

C) `"6"`

D) `"66"`

**9.** Which of the following declares an array?

A) `String[] strA;`

B) `double[] dataF = new double[10];`

C) `int[][][] num06;`

D) All of the other answers

**10.** Given statement below, what is the value of `(doubleA.length+doubleA[2])`?

```
String[] doubleA = {"4", "2048", "12", "512"};
```

A) 412

B) `412.0`

C) 124

D) `124.0`

**Section B: (40 marks)**

** Use concise and direct techniques / program codes we learn in our course. Useless or over-complicated techniques / program codes may be ignored or have penalty.*

** Ignore package statement, import statements or comments in program codes, unless specified.*

** Proper indentations required in writing program codes, unless specified.*

**1.** ***(10 marks)***

a)

There are three major object-oriented features in object-oriented programming. Name them and briefly introduce each one of them in one sentence.

*[6 marks]*

b)

Given the following expressions (with 4 integer variables **a,b,c,d** and one boolean variable **e**), identify the first and last operators to be evaluated in each expression.

i. `d>=c&&e!=a-c<=d+b`

ii. `a==d%b||d<b&&c<=b`

*[4 marks]*

**2.** ***(15 marks)***

```
public class Card { // represent Card
    public String cName; // represent its name
    protected int cCode; // represent its Code
    Card(String inName, int inCode){
        cName = inName;
        cCode = inCode;    }
}
```

Only consider the programme code given above, answer the following questions.

a) Identify and list all visibility modifiers that appear within the given code.

*[2 marks]*

b) Identify and list all primitive and reference types that appear within the given code.

*[2 marks]*

c) Draw the UML class diagram, only related to the given program code above.

*[5 marks]*

d) Write a new public method named `getInfo()` to this class, to get and return information.

- The method accepts no input parameter, but returns a string array.
  - The body creates and returns an array of two string elements, the first array element is the name and the second is the string converted from the code

*[3 marks]*

e) Write a new public method named `dspInfo()` to this class `Card`, to display information of the object on console.

- The method accepts no input parameter, and has no return.
  - The body displays information on console in one line, similar to sample output below.

```
Card Name: <name>; Card Code: <code>
```

*Sample Program Output*

```
Card Name: cdA; Card Code: 1357
```

*[3 marks]*

**3.** ***(15 marks)***

Based on the class `Card` in Question 2 above, write a new Java class named `MyCard`, which is a subclass of the class `Card`. The new class includes:

- A class field which is a public constant, a *default CODE*, named `DEF_CCODE` having an integer value of `23xxx`, a number consisting `23` and the "last 3 digits" of your Student ID.
  - E.g. Use the number `23357`, if your student ID is `xxxxx357`
- Two overloading constructors:
  - *(2-arguments constructor)* One constructor accepts two arguments: the first for setting the name field and the second for the code field. Its body simply calls its corresponding superclass constructor with these two input parameters.
  - *(1-argument constructor)* Another constructor accepts only one argument of string for setting the name. Its body simply calls its another constructor with the *default CODE* as its code, and the input parameter as its name.
- A main method, the entry point for starting the program. The method body
  - Creates an array containing 4 elements of `Card` objects as in the table below. The last element is an object of `MyCard` and is created with the 1-argument constructor.
  - Uses a `for` loop to display the information of all array elements on console by calling the related display method, similar to the sample program output below.

| Index | Card Name | Card Code | Type |
|---|---|---|---|
| 0 | cdA | 2134 | Card |
| 1 | cdB | 2135 | Card |
| 2 | cdC | 2136 | Card |
| 3 | cdD | *Default* | MyCard |

*Sample Program Output*

```
Card Name: cdA; Card Code: 2134
Card Name: cdB; Card Code: 2135
Card Name: cdC; Card Code: 2136
Card Name: cdD; Card Code: 23357
```

~ END ~