THE UNIVERSITY OF BRITISH COLUMBIA
CPSC 310: SAMPLE MIDTERM #1

Name: _____   **Student #:** _____

Signature: _____

Notes about this examination

1. You have 65 minutes to write this examination.
2. No notes, books, or any type of electronic equipment is allowed including cell phones and calculators.
3. Good luck!

	Marks	Max
Multiple Choice		**10**
True/False		**10**
11		**6**
12		**6**
13		**6**
14		**4**
15		**2**
16		**6**
Total		**50**

Multiple Choice

Choose the best answer for each question and provide a *one sentence* justification of your answer.

1. Class A has _____ superclass(es) and at least _____ field(s). **[2 marks]**

   a. 2, 3
   b. 1, 2
   c. 1, 3
   d. 0, 5
   e. 2, 2
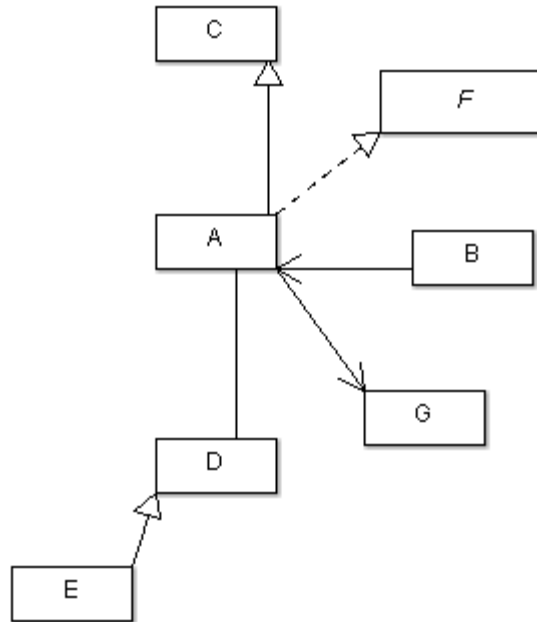
2. Which development process is the most appropriate for an experienced, 5-person team, working in a well-established company on a prototype for a new product that will rely on a recently-released open source library. **[2 marks]**

   a. XP
   b. Spiral
   c. Subsystem waterfall
   d. Staged Delivery
   e. Scrum

3. Which design pattern reduces coupling by providing a single point of communication? **[2 marks]**

   a. Singleton
   b. Mediator
   c. Observer
   d. Abstract Factory
   e. Composite
   f. None of the above

4. Which of the following requirements is the best functional requirement?

    a. The system only supports the English language.
    b. The user must be able to see "XXX is typing".
    c. The user can choose to view all the offline messages he received since his last log in a pop-up window.
    d. The user must be able to either accept or refuse being added to another user's contact list.

5. Advantages of democratic teams (vs. hierarchical teams) include
    a. faster decision making
    b. better ability to tackle difficult problems
    c. team members feel empowered because they help make decisions
    d. b and c
    e. all of the above

True/False

For each true/false question below provide a *one sentence* justification of your answer.

6. The design principles that we covered in class must always be followed to ensure that high-quality designs are created. **[2 marks]**

7. Rational Team Concert (Jazz) and other version control software can automatically merge all of the conflicts that arise when you deliver (ie, check-in or commit) your code. **[2 marks]**

8. Agile processes work best with small, highly-motivated, experienced software development teams. **[2 marks]**

9. You should always use a well-known architectural design pattern when designing your software because it will make the design easier to communicate to other stakeholders. **[2 marks]**

10. There is a class in the Smack API that manages the contact list. **[2 marks]**

Short Answer

11. You have been hired as a consultant by a large retail store to re-write their point-of-sale software (ie, software that runs the cash registers). The company has hundreds of cashiers, as well as supervisors and managers that will be using the software. The employees have been using the current system for years. Assume that you will be using the waterfall software development lifecycle. List all of the steps you would take during the requirements phase, and briefly explain why each step is important. **[6 marks]**

12. Compare and contrast the XP and Staged Delivery lifecycles. Be as thorough as possible. **[6 marks]**

13. Design Patterns
    a. Give a 1-2 sentence description of the Composite design pattern. **[2 marks]**

    b. What is the most important benefit of the Singleton design pattern? **[2 marks]**

    c. Give an example in which you would use the AbstractFactory design pattern. Your example cannot be from the course notes. **[2 marks]**

The space below is intentionally blank.

14. Design Principles
    a. Give an example of a problem that could occur if you did not follow the Liskov Substitution Principle. **[2 marks]**

    b. Briefly explain how following the principle of Information Hiding can help you create better designs. **[2 marks]**

15. Why is it important to associate each delivery with a work item when you're using Jazz (RTC) for your project? **[2 marks]**

16. Draw a UML class diagram for the following software system for modeling a restaurant. Make sure to include relationships, key methods, and multiplicities in your diagram.

    At a restaurant, groups of customers are seated at tables and each table is served by one server. Each customer orders from a menu. The menu contains sub-menus as well as individual items. At the end of the meal, each table is given a bill, which lists all of the items that were ordered by the customers at that table, along with the prices of the items and the total amount owing by the table. **[6 marks]**