ប្រឡងឆមាសទី២ ឆ្នាំទី៤ ដំណាក់ទី១៣ ឆ្នាំសិក្សា ២០២០-២០២១

មុខវិជ្ជា: Object-Oriented Analysis & Design II ឃ:ពេល: ៩០ នាទី

ឈ្មោះ _____ **ថ្នាក់** _13CS42Sb_ __**ថ្ងៃប្រឡង**__19__/__09__/_2021___ **ហត្ថលេខា** _____

(បញ្ជាក់: ប្អូនត្រូវសរសេរដោយដៃក្នុងក្រដាសA៤ រួចថតដំណោះស្រាយផ្ញើមកខ្ញុំតាមរយៈ Chat ផ្ទាល់ខ្លួនខ្ញុំតាមកម្មវិធី Microsoft Teams និង Telegram)

I. **សំណួរជ្រើសរើស** (**១** សំណួរទទួលបាន **១** ពិន្ទុ)

Instruction: *Read each question below carefully, then choose the best answer choice by A, B, C, D, or E.*

1. Which of the following techniques is a direct benefit of design patterns?
   A. Faster analysis
   B. Faster coding
   C. Ease of testing solutions
   D. Modifying the program is easier
2. Which of the following describes the State design pattern correctly?
   A. In this pattern, a class behavior changes based on its state.
   B. In this pattern, a null object replaces check of NULL object instance.
   C. In this pattern, a class behavior or its algorithm can be changed at run time.
   D. In this pattern, an abstract class exposes defined way(s)/template(s) to execute its methods.
3. Which of the following is correct list of classifications of design patterns.
   A. Creational, Structural and Behavioral design patterns.
   B. Executional, Structural and Behavioral design patterns.
   C. Creational, Executional and Behavioral design patterns.
   D. None of the above.
4. Which of the following is correct about Creational design patterns.
   A. These design patterns are specifically concerned with communication between objects.
   B. These design patterns provide a way to create objects while hiding the creation logic, rather than instantiating objects directly using new opreator.
   C. These design patterns concern class and object composition. Concept of inheritance is used to compose interfaces and define ways to compose objects to obtain new functionalities.
   D. None of the above.
5. You need to leave decisions about which class to instantiate to the subclasses of an abstract base class. Which pattern best assists in this task?
   A. Factory Method design pattern
   B. Flyweight design pattern
   C. Observer design pattern
   D. Mediator design pattern
6. A design pattern is _____.
   A. an algorithm used in object-oriented programming
   B. a data structure used in object-oriented programming
   C. a solution to a common problem in object-oriented programming
   D. a blueprint for a particular kind of class
7. Which of the following represents the process of defining two or more methods within the same class having the same name but different parameters list?
   A. Method overloading
   B. Method overriding
   C. Encapsulation
   D. None of the mentioned
8. Which of the following describes the Adapter pattern correctly?
   A. This pattern builds a complex object using simple objects and using a step by step approach.
   B. This pattern refers to creating duplicate object while keeping performance in mind.
   C. This pattern works as a bridge between two incompatible interfaces.
   D. This pattern is used when we need to decouple an abstraction from its implementation so that the two can vary independently.
9. Which of the following modifier applies when a virtual method is redefined by a derived class?
   A. overloads
   B. override
   C. overridable
   D. virtual
   E. base
10. Which of the following keyword should be prefixed to a member of the base class to allow overriding in the derived class?
    A. overload
    B. override
    C. new
    D. virtual
    E. base
11. What is Gang of Four (GOF)?
    A. Four authors of Book 'Design Patterns - Elements of Reusable Object-Oriented Software' are known as Gang of Four (GOF).
    B. Gang of Four (GOF) is a name of a book on Design Patterns.
    C. Gang of Four (GOF) is a Design Pattern.
    D. None of the above.
12. Which of the following represents the process where a method in a subclass has same name & type signature as a method in its superclass?
    A. Method overloading
    B. Method overriding
    C. Method hiding
    D. None of the mentioned
13. Which of the following modifiers can be used to prevent Method overriding?
    A. static
    B. Constant
    C. sealed
    D. final
14. Which of the following statements are correct for the given code snippet:
    Shape obj;
    obj = new Shape();
    A. Creates an object of class shape.
    B. To create an object of type shape on the heap or stack depending on its size.
    C. Create a reference obj of the class shape and an object of type shape on the heap.
    D. Create an object of type shape on the stack.
15. Which of the following Access specifiers can be used for an interface?
    A. public
    B. protected
    C. private
    D. All of the above

16. Which of the following statements is correct for the below code snippet?

```
public interface A {
    String FirstName {
        get; set;
    }
    String LastName {
        get; set;
    }
    void print();
    void assign();
    int func();
}
```

A. interface A to contain function definition.
B. properties cannot be declared inside an interface.
C. code compiles successfully.
D. All of the above.

17. A class is _____.
A. a classification of objects
B. a group of objects
C. a class of objects
D. template for objects of a particular type

18. Which of the following is a technique for hiding the internal implementation details of an object?
A. Polymorphism
B. Inheritance
C. Encapsulation
D. Abstraction

19. Inheritance in object-oriented modeling can be used to _____.
A. generalize and specialize classes
B. specialize classes
C. create new classes
D. generalize classes

20. The object-oriented development life cycle is which of the following?
A. Analysis, design, and implementation steps in the given order and using the steps no more than one time.
B. Analysis, design, and implementation steps in any order and using the steps no more than one time.
C. Analysis, design, and implementation steps in any order and using multiple iterations.
D. Analysis, design, and implementation steps in the given order and using multiple iterations.

21. Which of the following is correct about Structural design patterns.
A. These design patterns are specifically concerned with communication between objects.
B. These design patterns provide a way to create objects while hiding the creation logic, rather than instantiating objects directly using new opreator.
C. These design patterns concern class and object composition. Concept of inheritance is used to compose interfaces and define ways to compose objects to obtain new functionalities.
D. None of the above.

22. Attach additional responsibilities to an object dynamically. It provides a flexible alternative to subclassing for extending functionality.
A. Chain of responsibility design pattern
B. Adapter design pattern
C. Decorator design pattern
D. Composite design pattern

23. Encapsulate a request as an object, there by letting you parameterize clients with different requests, queue or log requests, and support undoable operation.
A. Adapter design pattern
B. Command design pattern
C. Decorator design pattern
D. Composite design pattern

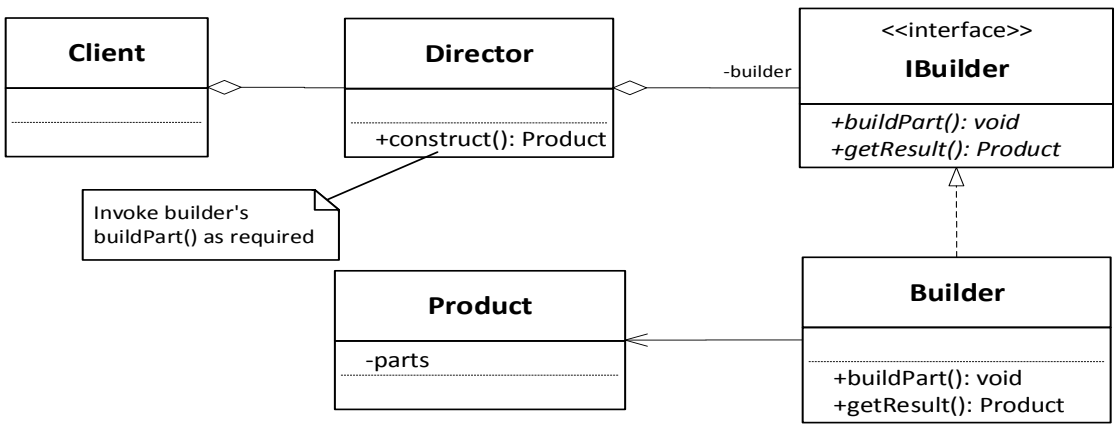
24. Which of the following UML diagrams has a static view?
A. Use case diagrams
B. Collaboration diagrams
C. State chart diagrams
D. Activity diagrams

25. Which of the following is correct about Behavioral design patterns.
A. These design patterns are specifically concerned with communication between objects.
B. These design patterns provide a way to create objects while hiding the creation logic, rather than instantiating objects directly using new opreator.
C. These design patterns concern class and object composition. Concept of inheritance is used to compose interfaces and define ways to compose objects to obtain new functionalities.
D. None of the above.

II. **សំណួរត្រៃរិះ និងលំហាត់**

26. (**៤ពិន្ទុ**) ចូរសរសេរ skeletal code ជាភាសា C# បង្កើតចេញនូវ class Manager មួយ ដែលវាឆ្លើយតបទៅនឹង Singleton design pattern។

27. នេះជា UML Class Diagram តាងឲ្យ Builder design pattern។

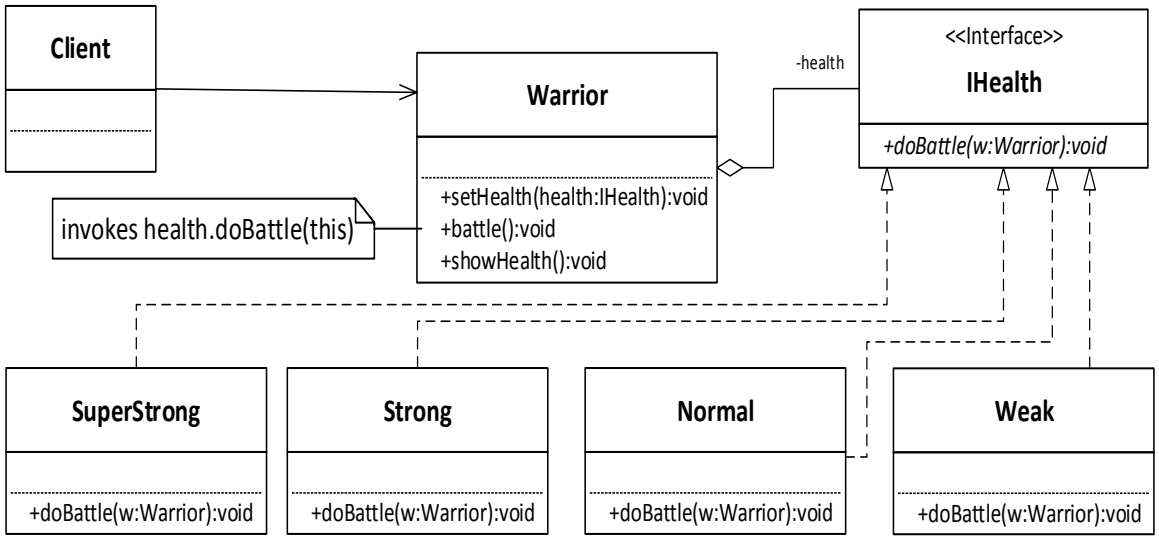


(**៣ពិន្ទុ**) តើ Classifier ណា ដែលជើរតួនាទីកំណត់ចេញ representation របស់ object?

28. (**៧ពិន្ទុ**)ចូរគូរ UML Class Diagram មូលដ្ឋានរបស់ Template Method design pattern ព្រមទាំងរៀបរាប់ពីអ្នកជើរតួ (Players) ដែលមានវត្តមាននៅក្នុងដ្យាក្រាម។

29. សន្មតថា អ្នកកំពុងសរសេរកម្មវិធីល្បែង (game) មួយ ដែលអ្នកលេង (player) គឺអ្នកចម្បាំង (warrior) ដែលចូលទៅប្រយុទ្ធក្នុងសមរភូមិផ្សេងៗគ្នា។ ដោយផ្អែកលើលទ្ធផលនៃការប្រយុទ្ធ អ្នកចម្បាំងអាចក្លាយទៅជា "ខ្សោយ (weak)" "ធម្មតា (normal)" "ខ្លាំង (strong)" ឬ "មហិមា (super strong)"។ អ្នកចម្បាំងទំនងជានឹងផ្លាស់ប្តូរទៅជាស្ថានភាពជាក់លាក់មួយដូចជា "ខ្សោយ" "ធម្មតា" "ខ្លាំង" ឬ "មហិមា" ដោយផ្អែកលើស្ថានភាពដែលគាត់មានមុនពេលដែលគាត់ទៅចូលទៅក្នុងការប្រយុទ្ធ។ បើមានអ្នកចម្បាំង ស្ថិតនៅក្នុងស្ថានភាព "ខ្លាំង" មុនពេលដែលគាត់ទៅចូលក្នុងការប្រយុទ្ធ នោះនៅចុងបញ្ចប់នៃការប្រយុទ្ធ គាត់ទំនងជាក្លាយទៅជា "មហិមា"។
(Assuming you are writing a game where the player is a warrior that goes into different battles. Based on the outcome of each battle the warrior can become strong, super strong, normal, or weak. These will be the different states that the warrior can be in. Also the warrior is more likely to transition to certain states based on the state he was in before he goes into the battle. If the warrior is in the strong state before he goes into the battle, he is more likely to become super strong at the end of the battle than if he started out weak.)

ខាងក្រោមនេះជា UML Class Diagram នៃចំណោទបញ្ហាដែលបានលើកឡើងខាងលើ



29.1. (**៣ពិន្ទុ**) ចូរកំណត់ pattern(s) សមស្របដែលគេប្រើប្រាស់សម្រាប់អនុវត្តការងារខាងលើ ដោយមានបញ្ជាក់ប្រាប់ពី Classifiers ចូលរួមនឹង pattern(s) នេះ។
29.2. (**៨ពិន្ទុ**)ចូរសរសេរ Skeletal Code ក្នុងភាសា C# សម្រាប់បណ្តា Classifiers នៅក្នុង pattern(s) របស់អ្នកកំណត់ចេញក្នុងសំណួរ **29.1**។