

南京邮电大学 2021/2022 学年 第 二 学期

《 软件工程（双语） 》期末试卷（A）

院(系)_____班级_____学号_____姓名_____

I . Design and Modeling (10×4=40 pts.)

- 1、As shown in the illustration figure, two coding cases are given by the software engineer. How will you model it separately as a designer. (10 pts)

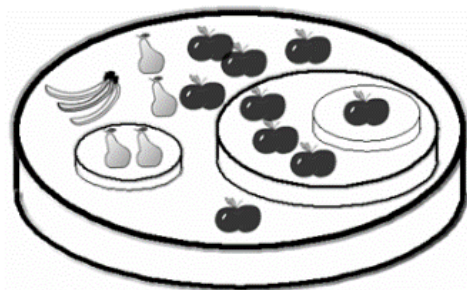
```
public class Car {  
    private Engine engine  
    public Car (Engine engine) {  
        this.engine = engine  
    }  
    public void setEngine (Engine engine) {  
        this.engine = engine  
    }  
}  
  
public class Engine {  
    ... ..  
}
```

case 1

```
public class Head {  
    private Mouth mouth  
    public Head () {  
        mouth = new Mouth()  
    }  
    ... ..  
}  
  
public class Mouth {  
    ... ..  
}
```

case 2

- 2、The combination of fruit plates is shown in the figure. How will you design and develop this system? Please use the class diagram to give the design model and explain the reasons for choosing the scheme.? (10 pts)

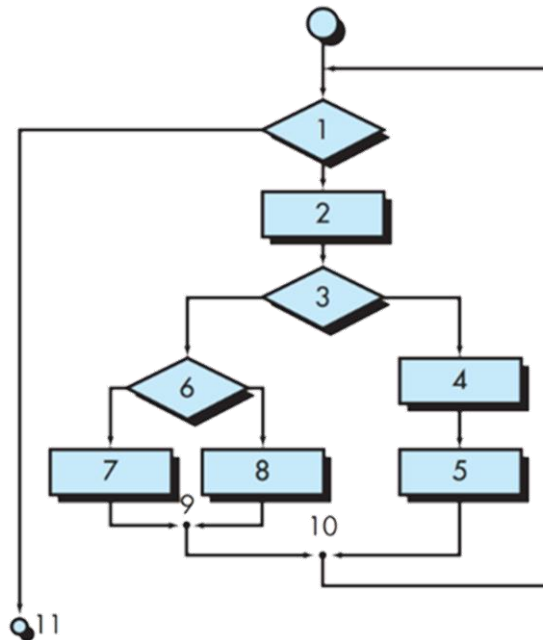


- 3、 Since the suppliers of products are not in the same city, when you place an order as shown in the figure on an e-commerce platform through the shopping cart, the system needs to provide the function of splitting the order into some delivery orders. Please model this function with UML activity diagram. (10 pts)

序号	商品编号	商品名称	供应商地址
01	C01	华为手机	上海
02	S03	打印纸	北京
03	D01	滑板	广州
04	N01	牛仔裤	北京
05	C02	iPad	上海
.....

- 4、 As shown in the figure, a flowchart is used to depict program control structure.

- 1) Draw the corresponding flow graph using the number in the flowchart. (4 pts)
- 2) Calculate the cyclomatic complexity of the procedure. (2 pts)
- 3) List all the independent paths for basis path testing. (4 pts)

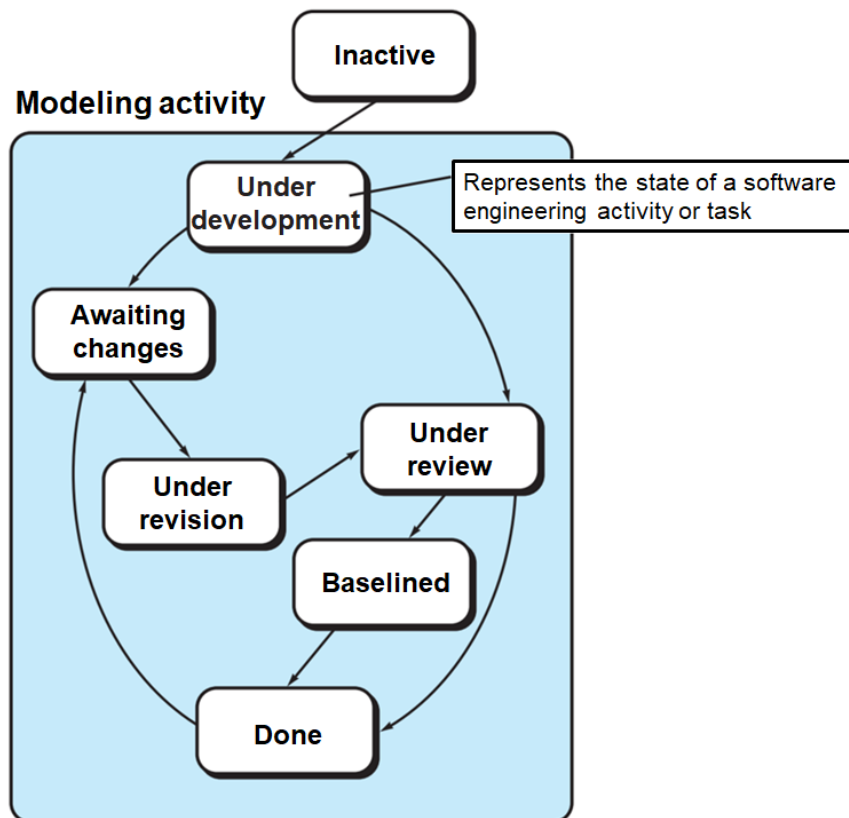


II . Analysis and Computation （15×2=30 pts.）

1、 At the beginning of the project, in order to elicit requirements, the following three questions were asked to customers and other stakeholders. Please try to analyze what the goal of each question is (9 pts) and what effect it has on the scheme selection of system construction (6 pts) ?

- 1) Who is behind the request for this work?
- 2) What problem(s) will this solution address?
- 3) Can anyone else provide additional information?

2、 Among the numerous software process models, the concurrent development model is often more appropriate for product engineering projects where different engineering teams are involved. As shown in the figure, it describes any iterative elements and concurrent elements in the development process. Please illustrate the workflow of the model with an example and talk about your understanding. （15 pts）



III. Comprehension and Discussion (15×2=30 pts.)

1、In an excellent paper on software process and projects, Barry Boehm [Boe96] states:

“[Y]ou need an organizing principle that scales down to provide simple [project] plans for simple projects.” Boehm suggests an approach that addresses project objectives, milestones and schedules, responsibilities, management and technical approaches, and required resources. **How do we define key project characteristics?** (15 pts)

2、In the drawing software system, the requirements are described below :

- 1) There are many geometric figure must be achieved, such as: rectangle, circle, polygon etc.
- 2) Different geometric figure have different implementation processes. an user choose an appropriate figure according to their own needs.

Please give a detailed discussion to elaborate how the design model meets the OO design principles, such as the **open-closed principle**, the **Liskov substitution principle** and the **dependency inversion principle** etc. (15 pts)

