浙江大学 2005－2006 学年冬季学期

《软件工程》课程期末考试试卷

开课学院：_计算机学院_ ，考试形式：开卷，允许带_一本课本_入场

考试时间：_2006_年_1_月_18_日,所需时间：_120_分钟

考生姓名：_____学号：_____专业：_____教师：_____

题序	一	二	三	四	五	六	总 分
得分							
评卷人							

I. Please select the correct answers and *fill in the answer sheet*: (20 pts.)

Note:* Zero point *for a blank selection since there is at least one answer for each problem.

1. Evolutionary software process models _____.(ab)
   a. are iterative in nature
   b. can easily accommodate product requirements changes
   c. generally produce throw away systems
   d. all of the above
2. Process framework activities are populated with _____.(d)
   a. milestones
   b. work products
   c. QA points
   d. all of the above
3. The structural design model includes the following components _____. (abcd)
   a. data design
   b. architecture design
   c. interface design
   d. procedural design
4. White-box testing can use the following methods _____.(cd)
   a. boundary value analysis
   b. equivalence partitioning
   c. loop testing
   d. BRO testing
5. _____ can test whether we have built the right product. (b)
   a. White-box testing
   b. Validation testing
   c. Integration testing

d. System testing

6. Which diagram(s) is (are) to be built in a system behavior model? _____(d)
   a. use-case
   b. ER diagram
   c. DFD diagram
   d. STD diagram

7. Use-case can be used to _____.(acd)
   a. define the functional and operational system requirements
   b. define the object hierarchy for the system
   c. provide a basis for validation testing
   d. provide a description of end-user and system interaction

8. _____ can be considered as candidate objects in a problem space. (abcd)
   a. Events
   b. People
   c. Structures
   d. Occurrences

9. UML design modeling focuses on the _____. (bd)
   a. structural model and behavioral model
   b. behavioral model and implementation model
   c. user model and environment model
   d. implementation model and environmental model

10. Design patterns can be used by applying _____ in object-oriented systems. (ac)
   a. inheritance
   b. encapsulation
   c. composition
   d. polymorphism

II. Please specify "T" (true) or "F" (false) for the following statements: (10 pts.)

1. The best person to hire as a project team leader is the most competent software engineering practitioner available. (F)
2. Project management is less important for modern software development since most projects are successful and completed on time. (F)
3. People who perform software quality assurance must look at the software from the customer's perspective. (T)
4. Change control is not necessary if a development group is making use of an automated project database tool. (F)
5. Business Process Engineering (BPE) define architectures that will enable a business to use information effectively. (T)
6. Using the concept of modularity in software design, we should try our best to subdivide software infinitely. (F)
7. The good design should be traceable to the analysis model. (T)
8. Program flow chart is easier to maintain than PDL for procedural designing.(F)
9. Improved execution performance is one of the primary benefits of object-oriented

architectures. (F)
10. All of random order tests are conducted to exercise different class instance life histories, which are based on the minimum test sequence.(T)

III. Please give brief answers to the following questions: (30 pts.)
1. Explain how size-oriented metrics differ from function-oriented metrics. (7pts.)

answer: Size-oriented measures are computed by normalizing **direct measures** of the software engineering process (e.g. effort or defects) over the **product size**, measured in **lines of code**.
Function-oriented measures are **indirect measures** that are computed from measures of the information domain of a business application and an assessment of its **complexity**.
Size-oriented metrics are relatively **easy to collect**, but can present problems when component-based or visual programming methods are applied. Function-oriented metrics **can be determined much earlier** in the software cycle, but are an abstraction that is open to interpretation.

2. Describe the process of management if your customer requests a new function being added to the current product. (7 pts.)

answer: A **change request** is submitted for evaluation for a change report is submitted to the change control authority (CCA).
The CCA makes the final determination as to the **status and priority** of the change.
An engineering **change order** (ECO) is generated for each approved change.
Items to be changed are **checked out of the project database** subject to its access control parameters.
The modified object is subjected to **SQA** procedures and **returned** to the project database.
Version control procedures are followed to produce the next version of the software.
Synchronization control is used to make sure that parallel changes made by different people do not overwrite one another.

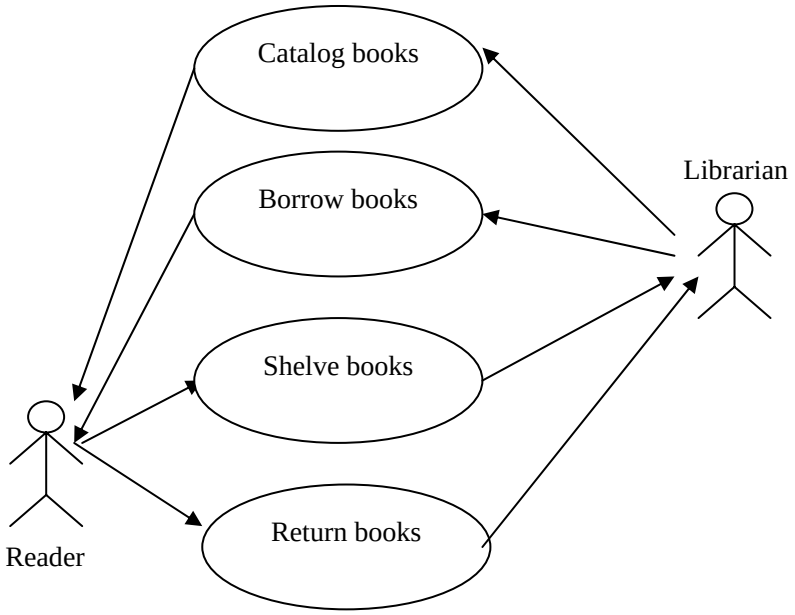
3. Given a procedure for computing the sum of absolute value of your input numbers:

```
①{ begin
   sum=0;
   input a;
②  do while a!=0 {
③      if (a>0){
④          sum+=a;
       }
       else
       {
⑤          sum−=a;
```

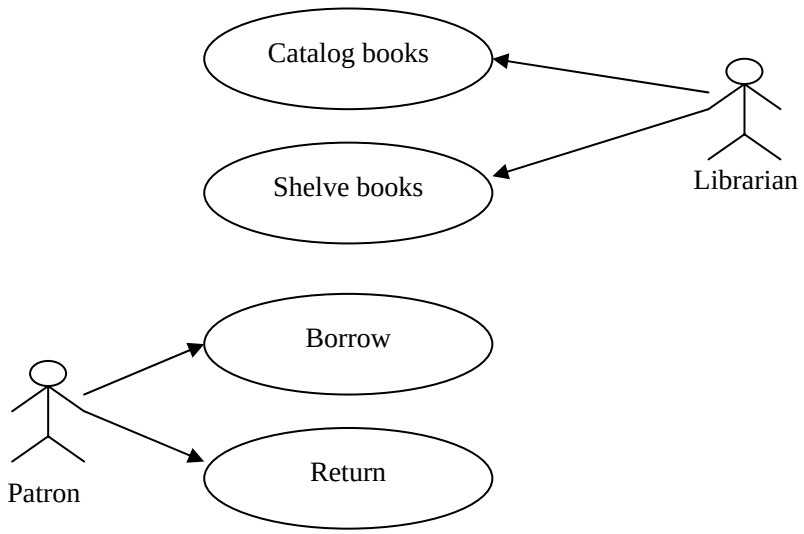
```
        }
⑥       input a;
    }
⑦   if(sum>0)
⑧       printf("The sum of your input is: %d",sum);
    else
⑨       printf("The sum of your input is: -999");
⑩   end
```

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

4. Identify and correct the errors in the following use case diagram for the simple library. (6 pts.)



Answer:



IV. Given the following description of a online bookstore system, please analyze the requirements of the software and complete the requested models. (40 pts.)

Online bookstore system: The purpose of the system is to provide a web site for book selling. Before users can buy books from the site, they should have registered to be members. Users buy books by putting them in their shopping cart on the web. During the shopping process, users can browse and query all books on the web and there is a brief description for each book. All the shopping information is stored in a database and checked every hour to arrange the delivery.

1. Please draw the data flow diagram for the system. (12 pts.)
2. Please derive the system structure from the data flow diagram. (10 pts.)
3. Please draw the system state transition diagram. (10 pts.)
4. Please give the CRC cards for book and shopping cart classes. (8 pts.)

Any consistent answers are acceptable.