

四川大学期末考试试题（闭卷）

(2020~2021 学年第 2 学期)

B 卷

课程号: 311232030 课程名称: 软件工程导论 任课教师: _____

适用专业年级: 软件工程 2019 级 学号: _____ 姓名: _____

考生承诺

我已认真阅读并知晓《四川大学考场规则》和《四川大学本科学生考试违纪作弊处分规定（修订）》，郑重承诺：

- 1、已按要求将考试禁止携带的文具用品或与考试有关的物品放置在指定地点；
- 2、不带手机进入考场；
- 3、考试期间遵守以上两项规定，若有违规行为，同意按照有关条款接受处理。

考生签名:

题 号	一 (35%)	二 (10%)	三 (55%)
得 分			
卷面总分		阅卷时间	

注意事项: 1. 请务必将本人所在学院、姓名、学号、任课教师姓名等信息准确填写在试题纸和添卷纸上；
2. 请将答案全部填写在本试题纸上；
3. 考试结束，请将试题纸、添卷纸和草稿纸一并交给监考老师。

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评阅教师	得分

一、简答题（本大题共 4 小题，共 35 分）。

1. What work products result from the requirements engineering process? (6 Points)
2. List three areas in which process models may differ from one another. (6 Points)
3. Please describe the differences between following items briefly. (15 Points)
 - (1) Framework and Pattern;
 - (2) Requirement and Specification;
 - (3) Construction and Development;
 - (4) Verification and Validation;
 - (5) Coupling and Cohesion;
4. List three golden rules that should be applied when building any user interface. (8 Points)

评阅教师	得分

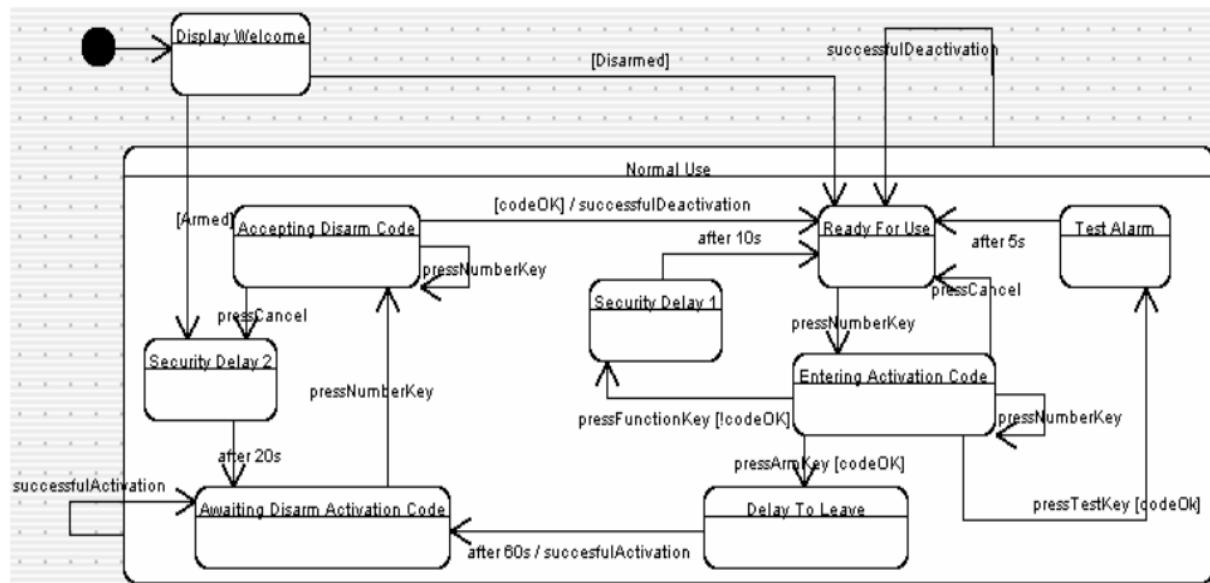
二、非标准答案题（本大题共1小题，共10分）。

Provide an example of software project that would be amenable to the incremental process model. Be specific. what an “increment” means in terms of project work and delivery. (10 Points)

评阅教师	得分

三、应用、设计及分析题（本大题共4小题，共55分）。

1. Following is the behavior of the Control Panel user interface for Safe Home system. Please design the GUI interface draft for the Control Panel. (15 Points)



2. The department of public works for a large city has decided to develop a Web-based potholes tracing and repair system (PHTRS 城市道路坑洼跟踪和修复系统). A description follows (16 Points):

Citizens can log onto a website and report the location and severity of potholes. (市民可以登录网站，报告道路坑洼的位置和严重程度。) As potholes are reported they are logged within a “public works department repair system” and are assigned an identifying number, stored by street address, size(on a scale of 1 to 10),location (middle, curb, etc.), district (determined from street address), and repair priority (determined from the size of the pothole). (当报告了道路坑洼时，系统会在“公共工程部门维修系统”内记录信息，分配一个识别号码，记录坑洼的地址、大小（范围从 1 – 10）、位置（路中间、路边等）、地区（根据街道地址确定）和修复优先级（根据坑洼的大小确定）。) Work order data are associated

with each pothole and include pothole location and size ,repair crew identifying number, number of people on crew, equipment assigned, hours applied to repair, hole status(work in progress, repaired, temporary repair, not repaired), amount of filler material used, and cost of repair(computed from hours applied, number of people, material and equipment used). (工作订单数据与每个道路坑洼相关联，并包括道路坑洼位置和大小，修理小组识别号码，修缮小组的人数，分配的设备、修复的小时数，修复的状态（正在修复、已经修复、临时修复、没有修复），使用的填充材料和维修的成本（按照所用小时数、使用的人员数、使用的材料和设备来计算）。) Finally, a damage file is created to hole information about reported damage due to the pothole and includes citizen's name, address, phone number, type of damage, and dollar amount of damage. (最后，将创建一个赔偿文件，以记录由于道路坑洼而造成的损失信息，包括公民的姓名、地址、电话号码、损坏类型和赔偿金额。) PHTRS is an online system; all queries are to be made interactively. (PHTRS 是一个在线系统；所有查询都是交互式进行的。)

- (1) Please create a E-R Diagram or Class Diagram to describe the data for the PHTRS system.
- (2) Please draw a UML Use Case Diagram for the PHTRS system.
- (3) Please develop an Activity Diagram to describe the citizens' reporting an issue of potholes in PHTRS system.
- (4) Please develop a sequence Diagram to describe the citizens' logging in PHTRS system.

Notes: You'll have to make a number of assumptions (假设条件) about the PHTRS system.

3. Given the program logic as follows: (12 Points)

```
if ( a > b && i > 1 || a < b && i <= 10 )
    k = a;
else
    k=b;
```

- (1) Please draw the Flow Chat for this program. (4 Points)
- (2) Please compute the cycle complexity of program. (3 Points)
- (3) Please list a set of independent path and design a set of test case for basic path testing. (5 Points)
4. There is an example of component design that violated both principles of OCP (Open-Closed Principle) and LSP (Liskov Substitution Principle). Please explain why the design violated OCP and LSP. (12 Points)

```
1 struct Point (double x, y);
2
3 struct Shape {
4     enum ShapeType { square, circle } itsType;
5     Shape(ShapeType t) : itsType(t) {}
6 }
7
8 struct Circle: public Shape
9 {
10     Circle(): Shape(circle) {};
11     void Draw() const;
12     Point itsCenter;
13     double itsRadius;
14 }
15
16 struct Square: public Shape
17 {
18     Square(): Shape(square) {};
19     void Draw() const;
20     Point itsTopLeft;
21     double itsSide;
22 }
23
24 void DrawShape(const Shape& s)
25 {
26     if (s.itsType == Shape::square)
27         static_cast<const Square&>(s).Draw();
28     else if (s.itsType == Shape::circle)
29         static_cast<const Circle&>(s).Draw();
30 }
```

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