浙江大学 2019－2020 学年春夏学期

《软件工程》课程期末考试试卷

课程号：21120261，开课学院：计算机科学与技术学院

考试试卷： **A √卷**、B 卷（请在选定项上打 √）

考试形式：闭、**开 √卷**（请在选定项上打 √），允许带 无 入场

考试日期： 2020 年 6 月 16 日，考试时间： 120 分钟

诚信考试，沉着应考，杜绝违纪。

考生姓名：_____学号：_____所属院系：_____

题序	一	二	三	总 分
得分				
评卷人				

I. Please fill in the following blanks: (15 pts., 1pt. for each)

1. Software is a set of items or objects that form a configuration that mainly includes：instructions, data structures and _____.

2. General process framework of Software Process includes five activities, they are: communication, _____, modeling, construction and deployment.

3. There are the four framework activities found in the Extreme Programming (XP) process model: planning , designing , coding and _____.

4. The requirements model properly reflects the_____, function and behavior of the system to be built.

5. The responsibilities are the _____ and _____ encapsulated by the class.

6. The _____ model should be traceable to the requirements model.

7. Three Golden Rules of UI design are: 1) _____; 2) Reduce the user's memory load; 3) Make the interface consistent.

8. There are essentially two basic approaches to WebApp's design: the_____ ideal of expressing yourself and the engineering ideal of solving a problem for a customer.

9. The FTR (Formal Technical Reviews) is actually a class of reviews that includes_____ and inspections.

10. Pareto Principle indicates that _____ percent of the defects can be traced to _____ percent of all possible causes.

11. In WebApp Testing Strategy, the_____ for the WebApp is reviewed to uncover errors.

12. EVA (Earned Value Analysis) provides accurate and reliable readings of performance from as early as _____ percent into the project.

13. The Software Reengineering usually includes following six activities: Inventory analysis, document restructuring,_____, code restructuring, data restructuring and forward engineering.

II. Please give brief answers to the following questions: (25 pts.)

1. Why does software need to evolve over time? (6pts)

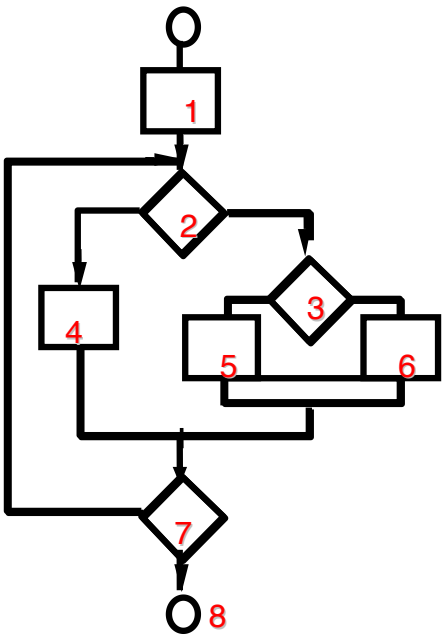
2. What are three primary objectives of the analysis model? What are the data modeling elements represented in the entity relationship diagram (ERD)? (6pts.)

3. According to following flowchart, suppose Predicate Node "2" and "3" are single conditions, "7" is compound condition. Please answer following question: (8pts)

(1) What is the value of Predicate Node number, *P* ?

(2) What is the value of the Cyclomatic Complexity, *V(G)*?

(3) Please list all independent logical paths for testing.



4. What are two characteristics of Software Risk? Suppose there are three risks (called as A, B and C risk, respectively), their probabilities of occurrence are 0.2, 0.6 and 0.8, respectively, and the cost to the project when these risks occur are $ 20,000, $ 15,000 and $ 10,000, respectively. Which risk exposure (Impact) should be given priority treatment? (5pts.)

III. Patent Processing System (PAPS) (60 pts.)

Software scope: An Intellectual Property Management Bureau (IPMB) wants to build a Patents Application Processing System (PAPS) to automate its patents process and improve the efficiency.

After inputting the name and email, the applier can register a new account. When he/she login the system, he/she can modify his/her profiles including the affiliation, phone number, address, etc. The applier can submit his/her patent application to the PAPS system. For each patent, the applier should select the patent topic catalog and input the following information: patent name, author, affiliation, abstraction, key word, attached file. Then, the applier can check the patent approval state, submit the corresponding letter according to the reviewers' comments.

The system will assign a primary engineer(PE) for every patent to process the application. PE will check the application format conformance briefly, then notify the applier that the patent will be reviewed formally or rejected directly. Then the PE will assign and invite the reviewers, and make the decision (approved, suspended, rejected) according the comments of reviewers. The reviewer can check the reviewing task, download the application, and submit the comments and decision online. Every PE can process several patents simultaneously. To facilitate the PAPS, the system need maintain some lists, such as reviewers list, patent topics list.

1. **Please draw the data flow diagram for processing a patent. (12 pts.)**

2. **Please give the two CRC cards for classes "applier" and "patent". (10 pts.)**

3. **Please give the state diagram for the "patent" class. (8 pts.)**

4. **Please draw the web-based software architecture of PAPS. (10 pts.)**

5. **Please describe the testing strategy for PAPS product. (10 pts.)**

6. **Please make the RMMM plan for the risk of software engineer change. （10pts）**