Quiz 4 for Software Engineering Course

June 6, 2022

考生姓名：_____学号：_____所属院系：_____

I. Please select the correct answers and fill in the answer sheet: (20 pts., 2pt. for each)

1) The incremental model of software development is _____

A) a reasonable approach when requirements are well defined.

B) a good approach when a working core product is required quickly.

C) the best approach to use for projects with large development teams.

D) a revolutionary model that is not used for commercial products.

2) _____ is(are) the feature(s) for extreme programming comparing to the other agile process models.

A) Pair programming B) Iterative model C) Test driven D) Build the features list

3) WebE Process must meet the following project feature(s): _____

A) Incremental delivery B) Frequent changes C) Short timeline D) Poor Budget

4) When we conduct a Collaborative Requirements Gathering meeting, we can _____.

A) Setup an agenda B) Build a definition mechanism

C) Control and track requirement change D) Assign a facilitator to control the meeting

5) The 40-20-40 effort distribution rule suggests that the least amount of development effort be spent on _____.

A) Analysis B) Design C) Coding D) Testing

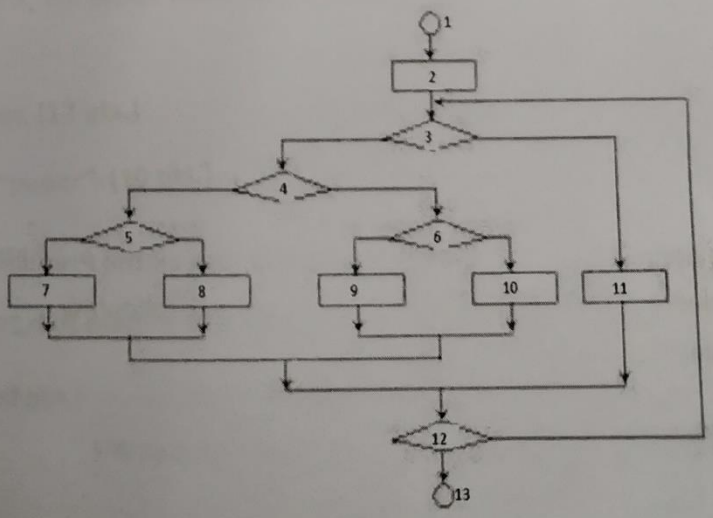
II. Please specify "T" (true) or "F" (false) for the following statements and *fill in the answer sheet* (10 pts.1pt. for each)

1. UML activity diagrams can be used to represent the user observable functionality delivered by the WebApp as well as the operations contained in each analysis class.
2. In component-based software engineering, the development team examines the requirements to see which are amenable to composition, rather than construction, before beginning detailed design tasks.
3. Unlike architectural patterns, component-level design patterns may be applied to solve sub-problems without regard to system context.
4. Quality control encompasses a set of software engineering actions that help to ensure that each work product meets its quality goals.
5. By collecting software metrics and making use of existing software reliability models it is possible to develop meaningful guidelines for determining when software testing is done.

III. Please give brief answers to the following questions: (20pts.)

1. For the software projects, a series of stakeholders are involved. Please list at least three types of stakeholders and give a brief explanation for them. (6pts.)

2. According to the right flowchart, suppose all the Predicate Nodes are single conditions. Please answer following Questions (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.

3. Suppose a piece of code is used to calculate the real value of the function defined for some integers. Please design the test cases by applying equivalence partitioning and boundary value analysis technique. (6 pts.)

IV. Paper Processing System (PPS) (50 pts.)

Software scope: A journal editorial board wants to build a Paper Processing System (PPS) to automate its paper process and improve the efficiency.

After inputting the name and email, the author can register a new user online. When he/she login in the system, he/she can modify his/her profiles including the affiliation, research interesting, country, etc. The author can submit his/her paper into the system. For each paper, the author should select the paper topic catalog and input the following attributes: name, abstraction, key word, cover letter, recommendation reviewers (name, email, affiliation), attached file. Then, the author can check the paper state, modify the paper according the editor's decision. The editor can assign and invite the reviewers, email the related review information to the reviewers, make the decision (accepted, minor revised, major revised, rejected), and notify the authors. The reviewer can accept or reject the invitation, check the reviewing task, download the paper, and submit the comments and decision online. To facilitate the PPS, the editor need maintain some lists, such as reviewer list, research topic list, and author list.

1. **Please draw the data flow diagram for processing a paper. (12 pts.)**
2. **Please give the two CRC cards for classes "author" and "paper". (10 pts.)**
3. **Please give the state diagram for the "paper" class. (8 pts.)**
4. **Please draw the web-based software architecture of PPS. (10 pts.)**
5. **Please describe the testing strategy for PPS product. (10 pts.)**