

83

**GRADUATE OUTREACH PROCTOR**  
**Test Instructions and Signature Page (Please return with completed exam)**

Semester:	Spring 2017
Course Name:	Software Quality Assurance
Course Number:	COMP 6716
Exam Number:	1
Professor:	Cross
Phone:	888-844-5300

Proctor: Andrew Ryan

Student: Robin Ward

**NO COPIES OF COMPLETED EXAM ARE TO BE GIVEN TO STUDENT**

**STUDENT IS RESPONSIBLE FOR COST OF MAILING EXAM BACK**

**THE PROCTOR, NOT THE STUDENT, MUST MAIL THE EXAM**

**Time Allotted for Exam:** 1 hour 15 mins

**Instructions for Administering Test:** Student is allowed a writing instrument. Closed book, closed notes.  
Please instruct student to place their answers directly on the exam.

**Exam return due date:** Wednesday, February 15, 2017 via email and mail hardcopy; STUDENT is responsible for contacting Professor if deadline cannot be met.

**THE SIGNATURE OF THE PROCTOR LISTED ABOVE IS REQUIRED FOR ALL EXAMS**

**Please explain below if someone other than the above proctor administers exam**

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I certify that the instructions were followed and I proctored the exam as stated.

Proctor's Signature Andrew Ryan Date Exam was Administered 2-8-17

EMAIL & MAIL exam & this SIGNED page to: April Hurley  
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Date: February 8, 2017

100 pts

- (5) 1. Describe what is meant by the statement: "software does not wear out, but it does deteriorate over time."

Software Death.  
This is the process of continually changing the software and addressing defects over time. The more changes over time, the more difficult it is to maintain the software that is why it will deteriorate.

- (15) 2. Name and briefly describe the four types of software maintenance. What is the 60/60 rule regarding software maintenance described by Robert Glass?

correcting issues → Corrective  
perfecting → Perfective  
Adapting to issues → Adaptive  
work to prevent issues → Preventive

### 60/60 RULE

The 60/60 Rule is a rule that applies to software maintenance. It states that 60% of the software process is maintenance. Of that 60%, 60% is enhancement of software improvements.

- (8) 3. What are the two most common causes for run-away software projects?

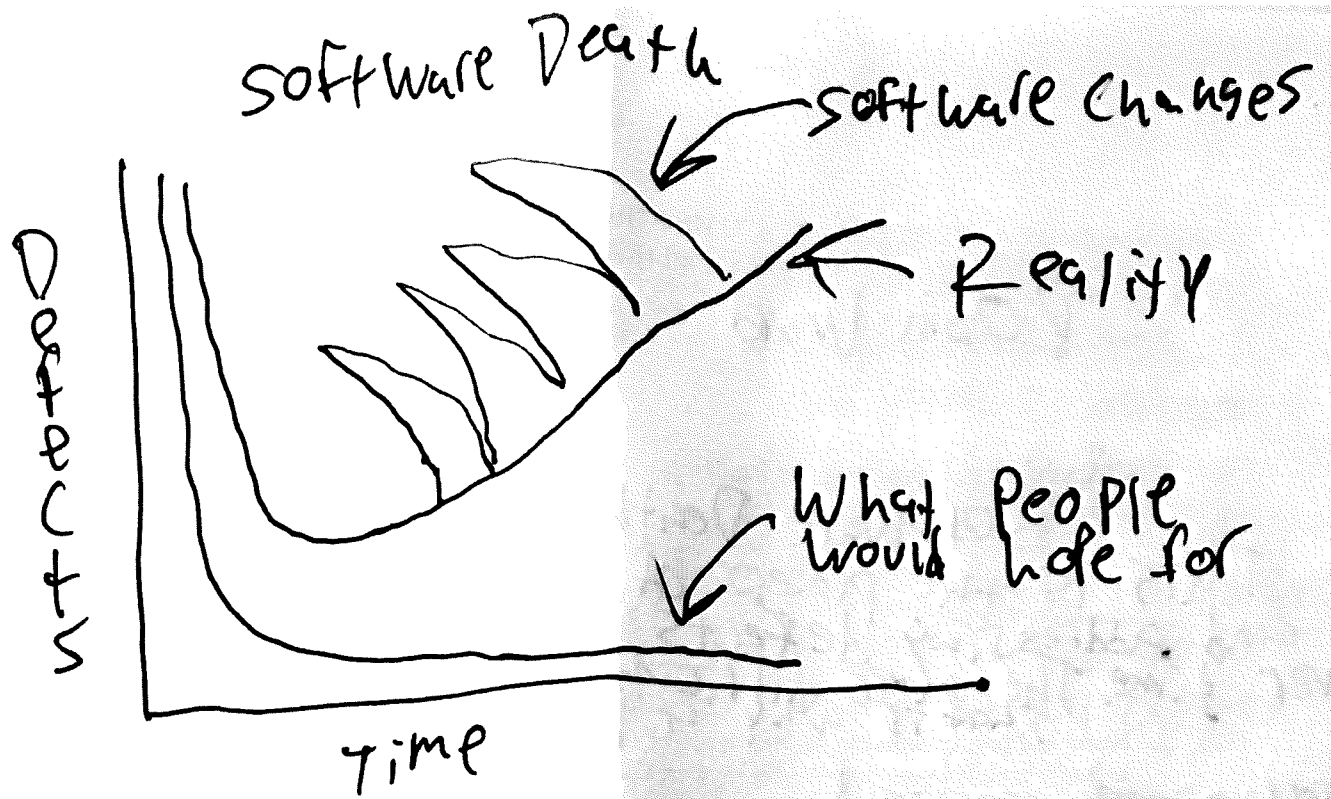
Unstable Requirements  
Optimistic ~~expectations~~ estimations

- (18) 4. Name the five levels of the *Capability Maturity Model* (or CMMI) and indicate why level 3 was perceived as difficult (costly) for organizations to reach in the paper "How Software Process Improvement Helped Motorola".

CMM  
initial  
Repeat  
Define  
managed  
Optimized

CMMI  
initial  
managed  
Define  
Quantitatively managed  
Optimized

Level 3 was so costly because it introduced software reviews. However, in the end this was a necessary step in order to reduce the amount of defects.



- usage modeling/probability distribution
- random test case generation

(12) 5. Name and briefly describe the three major steps in approach Cleanroom takes to software testing.

- 4
- Design
  - Test/certify
  - Configuration

~~The Cleanroom approach is the~~  
The purpose of the Cleanroom design is to release software defect free. The Design phase is the development of the software. Test/certify phase is preparing for production. Configuration is configuring the software in production.

(6) 6. Describe the concept of defect amplification.

Defect Amplification is the term used for

- 2 Defects that are left unattended until after the software is released. If a defect is found & addressed after it has been released to production, it is 60-100x more expensive than if it was caught in the first phase.

(6) 7. In terms of configuration management, what is meant by baseline?

✓ A baseline is "Software Version" that has been formally approved as the base for new builds. In order to change this, a Change control request will have to be initiated.

(12) 8. Name and describe the four major activities in configuration management?

- 3
- Verification - Verify that implementation was successful
  - Control - Control and ensuring configuration details
  - Auditing - Auditing the Process
  - Status accounting - Accountability of the steps and people involved.

-9

- (12) 9. Name four types of reviews used for verification and validation. Indicate the one that is usually lead by the author of the item under review. Also, indicate the one during which data items (e.g., defect counts, severity, etc.) are collected.

walkthrough  
(by author)  
audit

Peer Review - informal, not ~~as~~ as good as formal

Software Review - Review of the Process

Formal Review - A Review that has standards + expectations. Formal Voting may be involved.

Baseline Review - Review of the current state of the software.

~~inspect~~ inspection - data collected

- (6) 10. Describe how users may have very different perceptions of an application's reliability.

An application usually has a lot of advanced features that most people won't ever see. So

✓ For the average user, the application may seem very reliable, but the advanced user may experience ~~defect~~ failures with some of the more advanced features of the application.

Also, there are applications that could target two different demographics of people. Group 1 might encounter errors where Group 2 does not.

(100) Total points