CS 5/7314: Software Testing & Quality Assurance

Sample Exam #1

Oct. 2, 2023

Student name: _____

Exam grade: _____

General Instructions

- This is a closed-book exam, but one summary sheet (8x11, letter sized, single or double sided) is allowed. Please turn your summary sheet in with your completed exam.
- Read exam questions carefully before answering them.
- There are three questions, totaling 50 points. The point distribution is shown by each question.
- Exam duration for on-campus students (& distance students taking the exam on campus): 75 minutes.
- Distance students:
  1. Exam start time: You may start anytime after 3:30pm, 10/2/2023.
  2. Exam duration: 90 minutes total, including 75 minutes for taking the exam and an extra 15 minutes to handle the uploading/submission/etc.
  3. Deadline for exam submission: 90 minutes after you start your exam & before 5pm, 10/4/2023.
  4. You need around 3 sheets of blank paper to write your answers (no pencils, please, to ensure readability of the scanned exam).
  5. Be sure to clearly identify question numbers.
  6. When you finish answering the questions, you need to scan your answers and upload it to Canvas for submission.
  7. When upload your completed exam for submission, please try to use a single file, if possible.
- **Good luck!**

I. Choose *one* best answer for each question ..... *(3 points each, 15 points total.)*

1. This is NOT one of the quality attributes/characteristics we discussed in our class:
   a. reliability.
   b. safety.
   c. capability/functionality.
   d. maintainability.
   e. usability.
   f. security.
   g. cost/affordability.
   h. portability.

2. Match the following QA techniques to its classification:

i. inspection	a. defect prevention
ii. testing	
iii. safety assurance	b. defect removal
iv. fault tolerance	
v. process improvement	c. defect containment

3. Consider the SQE process:
   a. Quality planning is an important part of the SQE process.
   b. Quality assurance strategy formation is an important part of the SQE process.
   c. Quality measurement and model determination is an important part of the SQE process.
   d. Quality assurance activity execution is an important part of the SQE process.
   e. Quality measurement and analysis is an important part of the SQE process.
   f. Feedback and adjustment is an important part of the SQE process.
   g. All of the above.
   h. None of the above.

4. Consider the formal/systematic testing techniques we surveyed so far:
   a. None of them are needed, because ad hoc testing would be enough.
   b. None of them are needed, because informal testing would be enough.
   c. None of them are needed, because exhaustive testing will be performed.
   d. Only one is needed for a software product/system.
   e. Typically more than one are needed for a software product/system.
   f. All 7 techniques are needed for a software product/system.
   g. All of the above.
   h. None of the above.

5. Consider BBT, WBT, and UBST:
   a. BBT and WBT are both coverage based testing (CBT).
   b. BBT and UBST are both from external/user's perspective.
   c. WBT and UBST are both from internal/developer's perspective.
   d. a and b above.
   e. a and c above.
   f. b and c above.
   g. All of the above.
   h. None of the above.

II. Testing, QA, and SQE ..... *(5 points each, 15 points total)*

1. True or false? Fagan inspection is typically performed by 4 inspectors, while testing is typically performed by an individual tester. So personnel cost for inspection is 4 times that of testing. Briefly justify yourself.

2. Among BBT, WBT, and UBST, which one would be most effective in detecting problems with missing requirements? Briefly justify yourself.

3. What are the similarities and differences between the SQE process and the testing process?

III. Simple Coverage and Usage Testing ..... *(10 points each, 20 points total)*

1. If the requirements for a given software can be represented as a decision tree, construct a PT model & give some example test cases derived from you PT model. (Make up a concrete decision tree to start with.)

2. Now, assume that you have access to actual usage data (you can make up such data for the exam) for this software, construct a Musa-OP for UBST using either Musa-1 or Musa-2 OP construction procedures.