COMP 5710, 6710, 6716
Software Quality Assurance – Exam 1

Name: _____   Date: February 8, 2012

<u>100 pts</u>

(5)   1.   Draw a graph that illustrates "Software Death" with Failure Rate on the y-axis and Time on the x-axis. Include the idealized curve, a more likely actual curve, and the impact of changes. Describe why changes over time affect the actual curve the way they do.

(10)   2.   Contrast the waterfall life cycle development model with the incremental (or evolutionary) development model. Include the phases in each model.

(5)   3.   According to Glass in his paper "Frequently Forgotten Fundamental Facts about Software Engineering," about 35% of software defects emerge from missing logic paths (i.e., missing functionality). Describe an activity through which these defects could most likely be discovered and why.

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

(5) 5. Consider Fishman's "They Write the Right Stuff" and describe his position on how CMM level 5 encourages or stifles creativity of programmers.

(10) 6. Describe the approach the *Cleanroom* process model takes to statistical software testing. Be sure to include the three major steps.

(5) 7. In the *Cleanroom* approach to software engineering, *correctness verification* includes verifying every correctness condition of every control structure. How do modern languages such as Java support *correctness verification* at the code level? Include a short example.

(5)   8. What was Beizer's major objection the *Cleanroom* process model in the paper in which he provided a critical examination of the model?   What was his rationale?

(5)   9. Differentiate between a software defect (or fault) and a software failure.

(10)   10. Describe the concept of *defect amplification* in phases of software development.

(5)   11. Describe the primary objective *configuration management*.

(5)   12. In terms of *configuration management*, what is meant by *baseline*?

(8) 13. Describe the four major activities in *configuration management*?

(10) 14. Consider the following statements carefully and describe how each relates to testing and reliability. How are these two statements "connected" or related to one another?

One version of the *Pareto Principle* states that 80% of all end users generally use only 20% of an application's features.

One version of the *Pareto Principle* states that 80% of software failures can be traced to 20% of software faults.

The connection between the two statements is . . .

(100) Total points