Exam 1 – Fall 2013 – Solution Notes

1. a. v
   b. For generic products, the organization that develops the software controls the software specification. For custom products, the specification is usually developed and controlled by the organization that is buying the software.

2. d

3. The initial requirements specification stage is comparable to that of other software processes. During the requirements modification stage, the requirements must be (re-)analyzed using information about the components that have been discovered for reuse. If necessary and possible, the requirements are then modified, to reflect the available components. (Where modifications are not possible, the component analysis activity may be re-entered to search for alternative solutions.)

4. a

5. To help customers and developers better understand system requirements (via eliciting and validating requirements)

   Evaluating proposed solutions for feasibility, performance, etc. (="Experimental Prototyping")

   Developing and evaluating User Interface designs

   Back-to-back testing of a system with a validated prototype (being used as an oracle)

   Training users before system delivery


8. a. false; b. false; c. true; d. true; e. false; f. false; g. false

9. e.

10. Most students seemed to recognize the context of this question as Agile software development. (It was taken from the exercises at the end of Chapter 3.) Thus, most of the suggestions given for ways to avoid this potential problem preserved the agile principle of "having a user closely involved with a software development team."

    A typical suggestion from those students who did NOT recognize the context of the question was of the form, “Just don’t have a user closely involved with the software development team.” (This is comparable, in my mind, to asking how a dentist can best minimize the pain of a tooth extraction, and receiving the answer “just don’t extract the tooth.”)

    Most of the suggestions made in the spirit of Agile software development fell into one
of four categories:

(1) Rotating the user involved with the development team with different users,

(2) Isolating the user from influences/activities that could lead to his “going native” (i.e., no direct contact with actual developers, restrict interactions to formal meetings with an approved agenda, etc.),

(3) Incorporate an Incremental Delivery process so as to solicit feedback from other users (who are NOT closely involved with the development team), and

(4) Get other users involved by requiring that the “embedded user” routinely meet with (or otherwise interact with) other users to provide info and collect feedback.


13. a. Bass, et al., claim that informal block diagrams are poor architectural representations because they show neither (i) the type of the relationships among system components, nor (ii) the components’ externally visible properties.

   b. In contrast, Sommerville’s view is that block diagrams ARE an appropriate way of describing a system architecture during the design process. The rationale he gives is that they are easily understood by people from different disciplines who are involved in the system development process (since they are not cluttered with unnecessary detail), and are therefore a good way of supporting communications among stakeholders.

14. Parnas’ definition of information hiding: The isolation (“hiding”) of potentially changeable design decisions (e.g., in objects, functions, procedures, etc.) to minimize the impact of change.

15. Is a business model based on selling support for a product (rather than selling the product itself) appropriate?


17. Evolution life cycle phase: The system is in operational use and is evolving as new requirements are proposed and implemented.

   Servicing life cycle phase: The system remains useful, but the only changes made are those required to keep it operational (i.e., bug fixes and changes to reflect changes in the software’s environment). No new functionality is added.

18. Lehman’s “Law of Continuing Change:” A program that is used in a real-world environment must necessarily change, or else become progressively less useful in that environment.

19. b
Histogram of Raw Scores

[outliers]

50%  AVG