

>>> SOLUTION <<<

Welcome to your 10% mini-exam for *Senior Project*. The exam is open book and notes, but you may not receive or give help from or to another person during the exam. **You may have with you anything on paper (your notes, books, copies of the old exam solutions from the course website, etc.).** If you copy the answer directly out of the textbook (or some other source), be sure to properly “quote” the answer (otherwise it is assumed that any answer is given in your own words). There are 8 questions. You have 75 minutes for the exam. Please fill-in this cover sheet and submit it on top of your answer sheets. Please use a separate sheet of paper for each question.

Problem #1

Answer the following questions about the product development process...

a) Sketch the product development process as we have discussed and followed it in this class.

The key flowchart steps are: Requirements -> Specification -> Design -> Implementation -> Test -> Manufacture -> Distribute -> Maintenance -> End-of-Life. There is feedback from Test to Requirements (validation) and to Design (verification). An intermediate step of Prototype Design occurs after Design and before final Implementation.

b) We have repeatedly stressed the importance of traceability in this class. Indeed, you are required to have a traceability matrix in your specification. What are the two undesirable conditions that a traceability matrix in the specification can expose?

The traceability matrix in a spec will identify requirements not covered (i.e., missed requirement in the design) and “extra” items - features designed that are not in the requirements.

c) What is a milestone in a schedule? What is an “inchstone”?

A milestone is a major accomplishment that is measurable. A milestone is almost always indicated on a schedule. An inchstone is a minor accomplishment, but also measurable.

d) What should you do if your customer changes his or her requirement late in the schedule?

You, the developer, needs to manage your customer. You need to make the customer aware of impacts - such as cost and schedule slip - of desired new features. You need to be able to accommodate minor changes and otherwise propose how to best handle major changes.

e) What should you do if the requirements never become firm?

You need to make a best and reasonable guess on what the requirements will eventually be, and design and build to this “best guess”.

Problem #2

Outline the format of a requirements document as we have discussed it in this class.

A requirements document starts with a descriptive paragraph describing the situation (the landscape) and defining all terms and concepts. Assumptions are listed next. There requirement items - each non-overlapping and measurable (!) - are defined in a numbered list in priority order. The document must be titled, have contact information, and have version/date information.

Problem #3

What are the “Five W’s and one H” of a press release? This applies to more than press releases. Indeed any good expository writing should cover the five W’s and one H of the topic at hand.

What, When, Where, Who, Why, and How.

Problem #4

Describe the format of a test case as we have discussed it in class? What should a test case description contain? How are test cases selected or designed?

A test case must give the spec or requirement number covered, describe the system configuration, describe the inputs to the system, and precisely describe the expected outputs from the system. Good test cases cover representative and worst case uses of the system. Good test cases should also try to anticipate where error might be (e.g., “one off” errors in software coding) and explicitly look for these errors. The goal is, in any case, to break the system.

Problem #5

a) Where does the title “Mythical Man Month” (Brooks’ book) come from?

That man and months are interchangeable (in the essential sequential task of developing software) is the myth. Men and months can only be exchangeable when tasks can be partitioned among many workers with no communications between them. This is not the case in software development.

b) What are the key documents for a software project as described by Brooks in the Mythical Man Month?

In chapter 10 of MMM Brooks describes the key documents for a software project as: Objectives, Product Specifications, Schedule, Budget, Space Allocation, and Organization Chart.

Problem #6

What is the main premise of Brooks’ NSB article?

The main premise of the NSB article is that conceptual essence and not accidental parts are the difficult part of developing software and that there is likely no solution (no “magic bullet”) in the near term that will greatly reduce the conceptual essence of developing software. Essence is the selection of algorithms and design of a solution to solve a problem. Accidental parts are related to the production of code (such as programming languages, compiler technology, and so on).

Problem #7

Describe one thing you have learned from each of at least five of our guest presentations (we have had six guest presentations). I am looking for insightful answers, not simple (trivial) statements of what a company does.

To be graded individually. Answers need to be non-trivial.

Problem #8

It has repeatedly been stressed to you that you are “ambassadors” for USF in this class. What do we mean by “ambassadors” in this context? What are some of the possible results of being a good ambassador? What might be the results of being a poor ambassador? What are some example of being a “good” ambassador? What are some examples of being a “poor” ambassador?

An ambassador is a representative for their organization. As such, an ambassador must put the best foot forward in all cases. A good ambassador can open many doors for the “people” he or she represents (including for him or herself). A poor ambassador closes doors. In the context of this class, “doors” can mean jobs in companies. A good ambassador in the context of our class does good work in their project, is prompt, professional, and positive in all dealings, and otherwise “shows off” how good USF students and graduates can be. A poor ambassador misses meetings and deadlines, is non-response to customer (company) requests, falls asleep during guest lectures, and otherwise does poor work in their project.
