Department of Computer Science and Engineering  
College of Engineering, University of Nevada, Reno  

CS 425 Software Engineering  

Final Exam  

December 18, 2012  

Test type: Closed-book examination  
Number of questions: 17 Total points: 48 Weight: 28% of course grade Time: 105 minutes  

Notes:  
- For questions 1 to 10 indicate the correct answer (only one) on the answer sheets provided by the instructors. Questions 1 to 10 have each a one point value for a group total of 10 points.  
- Questions 11 to 17 require that you elaborate your answers. You must also write these answers on the sheets provided by the instructor. The total value of questions 11 to 17 is 38 points.  

Questions:  

1. Which of the following software process models best emphasizes component analysis?  
   a. Waterfall process  
   b. Incremental development  
   c. Boehm’s spiral model  
   d. Reuse-based software engineering  

2. Three key principles of agile methods are:  
   a. Incremental delivery, embrace change, customer involvement  
   b. Formal specifications, people not process, maintain simplicity  
   c. Embrace change, people not process, risk analysis  
   d. None of the above (that is, none of the above lines contains three valid key principles of agile methods)  

3. Which of the following can be used for writing requirements specification?  
   a. Test harnesses  
   b. Mathematical specifications  
   c. Gantt charts  
   d. Dynamic programming  

4. What kind of software is tested during release testing?  
   a. Program components that need to be integrated by the development team  
   b. Program units such as methods or classes  
   c. A software system intended for use by customers and users  
   d. None of the above  

5. Which of the following can be used as metrics for specifying non-functional requirements?  
   a. Size  
   b. Speed  
   c. Portability  
   d. All of the above  

6. What is meant by an emergent system property?  
   a. A functional system property derived from a set of use cases  
   b. A planned system property that will be implemented using future technology  
   c. A system property that is evident only once the system components have been integrated  
   d. A system property that is deemed necessary after several years of operation
Which of the following architectures (architectural patterns) is best suited for incorporating security requirements?
- a. Pipe and filter architecture
- b. Layered architecture
- c. Repository architecture
- d. Client-server architecture  

[1 point]

Which of the following is a factor that affects software pricing?
- a. Market opportunity
- b. Requirements volatility
- c. Cost estimate uncertainty
- d. All of the above  

[1 point]

Legacy systems are:
- a. Old computer-based systems still in use by organizations
- b. Software systems not yet implemented
- c. Reverse engineered computer-based systems
- d. None of the above  

[1 point]

In system safety terminology, a hazard is:
- a. A measure of the probability that the system will cause an accident
- b. An unplanned event that results in human death or injury, or property damage
- c. A condition with the potential for causing or contributing to an accident
- d. A measure of the loss resulting from a mishap  

[1 point]

Describe the waterfall software engineering process model. Also, indicate its advantages, disadvantages, and applicability.  

[6 points]

Describe the layered architecture pattern used in architectural design. Also, indicate its advantages and disadvantages.  

[5 points]

Briefly describe five (5) principles or practices of extreme programming (2-3 lines each). [Recall that there are 10 such principles or practices presented in Chapter 3 of the textbook.]  

[5 points]

Briefly describe the three main categories of software maintenance (fault repairs, environmental adaptation, functionality addition) and provide a concrete example for each.  

[5 points]

Assume you are a software project manager. Indicate four way (means) you would use to motivate the people working under your supervision.  

[4 points]

Briefly explain what is meant by each of the following 4 main dependability components: availability, reliability, safety, and security. In addition, indicate 2 other system properties that can be considered dependability properties.  

[6 points]

Consider your group project in CS 425/625.
- a. Briefly describe the project’s topic, its significance and/or utility, and its most important features (7 to 10 lines).
- b. List the project’s 3 most important use cases.
- c. Briefly indicate the main components (subsystems/modules) of your project’s software (at least 3 such components should be listed).
- d. Indicate 3 possible enhancements for your project.  

[7 points]