

College of Charleston
Department of Computer Science
CSCI 362 Software Engineering
Fall 2006
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Name:

Score:

Midterm Examination

Answer all questions with complete sentences unless noted otherwise in the question. You may use the back of the exam papers to organize your thoughts and for continuations of answers when necessary. Please write your answers legibly.

1. Compare and contrast Software Engineering and Computer Science.

2. List the names of five lifecycle software-development models.

Name:

3. The invention of statecharts overcame a major problem with state-transition diagrams (finite state machines) by introducing three improvements. What was the problem and what were the three improvements?

4. To help fight terrorism, many countries are planning the development of computer systems that track large numbers of their citizens and their actions. Discuss the ethics of developing this type of system. Be sure to refer to specific parts of the ACM code of ethics.

Name:

5. Explain why legacy systems can cause difficulties for companies that wish to reorganize their business processes.

6. Reliability and safety are related but distinct dependability attributes. Describe the most important distinction between these attributes and explain why it is possible for a reliable system to be unsafe and vice versa.

Name:

7. Draw an example of generalization in UML and an example of aggregation in UML.

8. Why does Fred Brooks believe that the concept of the Man-Month in software engineering is mythical?

9. What is the critical distinction between a milestone and a deliverable?

Name:

10. Explain why programs that are developed using evolutionary development are likely to be difficult to maintain.

11. In general, the more closely you can effectively follow a linear, waterfall-like, lifecycle model for software development, the more rapid your development will be. Do you agree or disagree? Explain.

12. Describe four types of non-functional requirements that may be placed on a system.
Give examples of each.

13. A safety-critical software system for treating cancer patients has two principal components: (1) A radiation therapy machine controlled by a software system, and (2) a treatment database that stores details of each patient's treatment, which are downloaded to the therapy machine. Identify three potential hazards in this system. For each hazard, suggest a defensive requirement to reduce the probability that the hazard will cause an accident; explain your reasons.

Extra Credit:

14. What does the acronym ACM stand for?

15. (a) What is the formula for the number of two-way communication channels between the members of a development team who each communicate with each other?

(b) What is the formula when the team is organized as a star topology?

a:

b: