

## CS5500, Fall 2004, Test 2

Chapters 1-14. Time 60min. Closed books, notes, except your minds only. Use extra paper as needed, but make sure to identify each answer. If anything is not clear, state a reasonable assumption and answer the question.

YOU MUST RETURN THIS PAGE. NAME \_\_\_\_\_

- 1 (15) Suppose a unit is tested by execution.
  - a) What is the advantage of doing so?
  - b) What are the disadvantages of doing so?
  - c) Suppose we cannot test the unit exhaustively and thus must select some test cases. Name or explain the important kinds of test cases to be run.
  
- 2 (10) Suppose we can test the unit exhaustively and verify that it always produces the correct answer.
  - a) Can the unit still be unacceptable in any way? In what way, and how would we assess it?
  - b) Would the module need to be ever retested (to verify that it still produces correct answers) in the same application? Under what circumstances?
  
- 3 (10) For an arbitrary software product, can we perform exhaustive testing to verify correct behavior? Why or how?
  
- 4 (10) What are the reusable components in
  - a) library architecture
  - b) framework architecture
  
- 5 (20) You have 3 products to develop P1, P2, and P3. Using COCOMO you determine that they are 20, 50, and 100 person-month respectively. You have 2 contracted teams, T1 and T2, costing you \$20k and \$30k a month only when they work, respectively, and with 1.0 and 0.5 team multipliers, respectively. Suppose both teams are familiar with all products, but a product must be developed by a single team. What will be task assignment to
  - a) Minimize overall time to market
  - b) Minimize development cost
  - c) Suppose both teams must be paid until all 3 products are completed. Would your answer to b) change and how?
  
- 6 (25) Imagine a locomotive with the following controls. There are + and - buttons (each time pressed, they cause the speed to increase/decrease by 1), there is a lever with two positions Forward and Backward (it can be moved only when the locomotive is at rest). There is also a bell that stays on whenever the train is moving backward. There is also a red light that stays on whenever a speed of at least 90 miles per hour is maintained. Finally, there is a speed limit of 100 mph forward and 20 mph backward (increasing speed has no effect). Using the extended notation, draw the State Diagram.