

Please return the Q-paper with your answer script.

### Major Exam, CSL740 (Software Engineering), May 2008

**Answer all questions briefly (marks will be deducted for long answers). Answer each question on a separate page, and each answer, except of the last two questions, should fit in one page. (TIME: 90 mts; Total: 60)**

- (8) Suppose that the last round of testing, in which all the test suites were executed but no faults were fixed, took 7 full days (24 hours each). And in this testing, the number of failures that were logged every day were: 2, 0, 1, 2, 1, 1, 0. If it is expected that an average user will use the software for two hours each day in a manner that is similar to what was done in testing, what is the expected reliability of this software for the user?
- (10) Suppose a *find* program has been written which takes two parameters – a pattern and a file name, and reports all lines in the file that have the specified pattern. (This is like the *grep* tool in Unix.) The specification for the program mentions maximum length of the pattern, whether the pattern is enclosed in quotes, and whether the pattern contains embedded quotes. Design a set of test cases you will use to test this program. The answer should be a table of this type:

Specific method employed for designing the test case	Condition being tested	Test inputs	Expected outputs
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- (8) What is structured programming? How does it help in verifying programs?
- (8) A project uses the timeboxing process model with three stages in each time box – requirements specification (done on customer site), build (done offshore), and deployment (done on customer site). Suppose the requirements stage takes 2 weeks with a team of 2 people, the build stage takes 3 weeks with a team of 4 people, and deployment takes 1 week with a team of 2 people. Design the process for this project that maximizes resource utilization.
- (8) Suppose an internet game has been developed. The game company wants that at release time the game works properly for the two major browsers (IE and firefox) and for two different modes of communication (broadband, wireless), and on three windows platforms (XP, 2000, NT). Assume that the memory size and processor is not an issue. Give a set of test cases (as close as possible to the smallest set) to satisfy the pair-wise testing criteria.
- (8) What is coupling and cohesion for a program? In OO software, what are the various types of coupling and cohesion?
- (10) (Follow up of the Minor I problem) Suppose for the Colloquium course, CSE wants to build an web-based system. Each student submits his report, along with the keywords characterizing it. After the deadline, the Prof selects three students as reviewers, based on their interests and conflicts (which they have entered on registry time), using some heuristics. The assigned reviewers submit their evaluation, based on which the Prof finally decides the final grades to reports, and then generates reports in grade sorted order or rollno sorted order. You have been asked to design this system. (1) Draw the class diagram(s) for your design, and (2) For the use case *assign reviewers* (for which the primary actor is the Prof) draw the sequence diagram.