

SOFTWARE ENGINEERING — CSC 408F

End Term Test (25% of course mark)

December 8, 1999.

Seven questions on two pages. 100 marks total. 50 minutes total

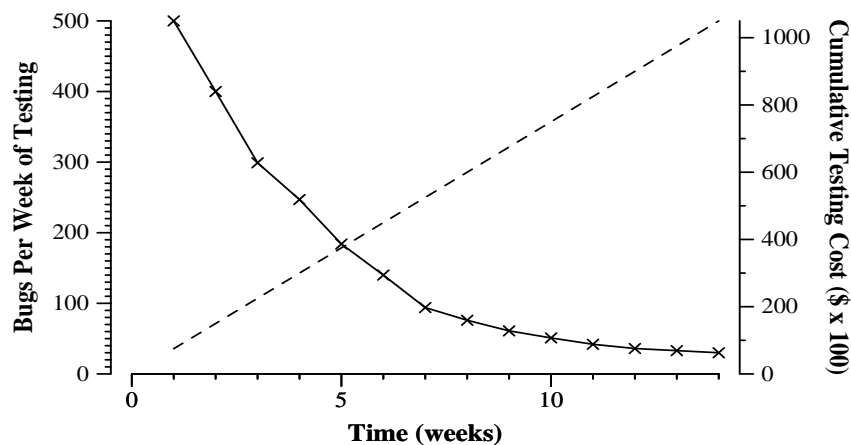
One $8\frac{1}{2}$ X 11 Aid Sheet. No other aids permitted.

Answer ANY 5 questions. All questions have equal weight. WRITE LEGIBLY!

1. For Phase E of the course project, the client has requested that all big strings be "transparent".

Transparency - It should be possible to store any value that will fit as a character in a BigString. For ASCII characters this means any value in the range -128 .. 127 (or 0x00 .. 0xFF). It specifically includes the possibility that the null character (0x00) may occur *inside* a BigString.

- (a) Discuss the technical issues related to implementing this request.
 - (b) Estimate the time and effort required to make this change to your Phase D project software.
2. Assume you are heading the Software Quality Assurance Group that is responsible for testing the addition to the bigString package described in the previous question. Design a comprehensive set of tests to test the bigString package after this feature has been added. Describe each test and explain its purpose.
 3. The graph below shows management data that was gathered during the testing of a particular software project. The solid line shows the number of bugs discovered per week of testing. The dashed line shows the cumulative cost of the testing effort.
 - (a) Why is this kind of data important to the Manager of Testing?
 - (b) What other important information can you infer from this graph?
 - (c) Based on this information, what conclusions can you draw about the testing effort on this project?



4. *Design for Maintainability* has been an important theme through this course. Using the steps in the Waterfall Model (Requirements, Specification, Design, Implementation, Testing) as a guide, describe what should be done in each step to facilitate the maintainability of the software.
5. Assume that you have just been hired as the manager of the software development team for an important piece of web-commerce software. The previous manager was fired because his team was always behind schedule and the software they produced was full of errors. When you interviewed the developers, you discovered that they were not using a version control system or software configuration management.
 - (a) What steps would you take to deal with this situation?
 - (b) What problems would you expect to have in establishing a proper version control archive?
 - (c) How would you convince the developers to accept these changes?
6. Assume you are responsible for the User Support Group in your organization. Your group provides the interface between users of the software produced by your organization and the software developers. Your organization is about to start the design of a major new product that will be shipped to customers two years from now. You have been asked to provide input to the Requirements process. What *four things* would you ask for to make it easier for your group to support this future product?
7. The System model below indicates dependencies among source files in a software system. The .h files are interfaces, the .c files are implementations.

File	Depends On	File	Depends On
A.h		A.c	A.h
B.h	A.h	B.c	B.h
C.h		C.c	C.h
D.h	B.h , C.h	D.c	D.h
E.h	C.h	E.c	E.h
F.h	D.h	F.c	F.h
G.h	E.h	G.c	G.h , F.h
		H.c	C.h D.h E.h F.h G.h

- (a) Draw a diagram showing the interfile dependencies in this software.
- (b) If the file A.h is changed, what files need to be recompiled in order to bring the system back into a consistent state?