Software Engineering Final Exam

January 17, 2003

1. Please specify "T" (true) or "F" (false) for the following statements: (30 pts.)

(1) Adding more people to a project that is already behind schedule is a good way to catch up. ( )

(2) The three generic phases of software engineering are definition, development, and support. ( )

(3) Sales people is a key player in the software process. ( )

(4) Software feasibility is mainly based on business and marketing concerns. ( )

(5) Timeline charts assist project managers in determining what tasks will be conducted at a given point in time. ( )

(6) People who perform software quality assurance must look at the software from the customer's perspective. ( )

(7) Configuration audits are needed even if you make use of formal technical reviews as part of your software engineering process. ( )

(8) System models are built to allow the system engineer to evaluate the system components in relationship to one another. ( )

(9) Implementation view should be considered first during software requirements analysis. ( )

(10) The state transition diagram depicts functions that transform the data flow. ( )

(11) Information hiding makes program maintenance easier by hiding data and procedure from unaffected parts of the program. ( )

(12) With thorough testing it is possible to remove all defects from a program prior to delivery to the customer. ( )

(13) Improved execution performance is one of the primary benefits of object-oriented architectures. ( )

(14) Unlike structured analysis, top-down decomposition and consideration of end-to-end processing sequences are not present when OOA is used. ( )

(15) Object-oriented designs do not need to be implemented using object-oriented programming techniques. ( )

2. Please answer the following questions: (30 pts.)

(1) Explain what is wrong with the notion that software engineering is too time consuming and interferes with a programmer's productivity. (6 pts.)

(2) How does perfective maintenance differ from adaptive maintenance? (6 points.)

(3) Explain why encapsulation, inheritance, and polymorphism are three important characteristics of object-oriented systems. (9 pts.)

(4) Explain the role of each element of the conventional analysis model: data dictionary, entity relationship diagram, and data flow diagram. (9 pts.)

3. Given the description of a system, please analyze the system requirements and complete the requested models by either the conventional methods or the object-oriented methods. (40 pts.)

The E-mail System description: You are responsible for the development of an electronic mail (e-mail) system to be implemented on a PC network. The e-mail system will enable users to receive letters from another user, or to create letters to be mailed to another user or to a specific address list. Letters can be read, copied, stored, etc. The e-mail system will make use of a simple full-screen editor on a video display terminal to create letters. The editor allows text to be inserted, deleted, and modified. Sections of text can be "cut" from one part of the file and "pasted" to another part of the file. The user can specify a text string, and the editor can find the next occurrence of that string. Through the editor, the user can specify margin, background, and tab settings.

Please specify your choice here: **A** – conventional methods; or **B** – object-oriented methods

A	B
(1) Please draw the data flow diagram for the e-mail system. (10 pts.) (2) Please describe at least 4 important data by data dictionary cards. (8 pts.) (3) Please draw an entity relationship diagram for the e-mail system. (5 pts.) (4) Please draw a system hierarchy based on DFD given in step (1). (12 pts.) (5) Suppose you have 5 people in your team. As the project manager, how would you assign jobs to your team members according to Chief Programmer Team organization? (5 pts.)	(1) Please draw the data flow diagram for the e-mail system. (10 pts.) (2) Please draw an event trace diagram for the normal use case of the e-mail system. (5 pts.) (3) Please draw the class diagrams and specify the relationships between objects. (12 pts.) (4) Please draw at least 2 state transition diagrams. (8 pts.) (5) Suppose you have 5 people in your team. As the project manager, how would you assign jobs to your team members according to Chief Programmer Team organization? (5 pts.)