This is a closed book, individual test. You are not allowed to use your notes or texts. You have 80 minutes. There are 100 points in total. Use your time accordingly.

If you find a question ambiguous, document the ambiguity and indicate which way you interpreted the question in a set of separate sentences next to the question. The questions on the exam are not intended to be ambiguous, but sometimes another meaning is interpreted by the examinee that the creator of the exam did not take into consideration.

Problem #1

Below is the skeleton of the diagram that represents the approach to computer system design espoused in this class.

![Diagram of triangle and circle]

a) Fill in the blanks that label the vertices of the triangle (A, B, C), the center of the triangle (E), and the surrounding circle in which the triangle sits (D). [5 points]

A. ___________________________
B. ___________________________
C. ___________________________
D. ___________________________
E. ___________________________

b) For each of the following phonemononon, indicate which vertex is influencing which other vertex. [5 points]
i) Different computer response times cause people to choose different strategies, e.g., telneting to a faster machine or running a program locally.

Vertex _______ ------ influences ----> Vertex _______

ii) Spreadsheets have unleashed hundreds of new tasks.

Vertex _______ ------ influences ----> Vertex _______

iii) People cannot remember all the information in a database, so they must search for information.

Vertex _______ ------ influences ----> Vertex _______

iv) People change their knowledge as they perform, i.e., they learn.

Vertex _______ ------ influences ----> Vertex _______

v) Text-editing can be done naturally with a keyboard; graphic editing is more suited to a drawing device, e.g. mouse or pen.

Vertex _______ ------ influences ----> Vertex _______

Problem #2

In class we discussed choosing appropriate tasks to model, study, or test. Which of the following are the two most reasonable methods to use for deciding on the tasks to use in the design of an electronic "card catalog" for a children's library (circle two) [2 points]

a) Go to a children's bookstore and ask the customers the tasks they might perform with such a system.

b) Observe children in a library with a regular card catalog and see which tasks are most frequent.

c) Choose tasks that cover all the possible functions and features of the system you are designing.

d) Have your design group use the system and see which tasks you perform most.

e) Ask children's librarians which are the most important tasks and why.

Problem #3

GOMS

a) What does GOMS stand for? [4 points]
b) What are GOMS models good at predicting? [2 points]

Problem #4

Name the three processors in the Model Human Processor and the most important parameter of these processors that we can use in performing an analysis. [4 points]

Problem #5

What is an independent variable in an experiment (in general)? [3 points]

Problem #6

Circle the one answer that best completes the sentence [2 points]

A dependent variable

a) is an amount that can be deducted from your income tax.

b) never changes once the experiment begins.

c) measures time or number of errors.

d) is a measurement believed to change as a result of varying the independent variable.

e) refers to one of the types of treatments that are administered or controlled for in an experiment.

Problem #7

What is a common dependent variable in an HCI experiment? [2 points]
Problem #8

Why do you need to have several evaluators use Nielsen's heuristic evaluation technique instead of having just one? [4 points]

Problem #9

Circle the one answer that best completes the sentence [2 points]

A verbal protocol analysis

a) is an effective method for determining whether one design is better than another design.

b) is a verbalization of an individual's thought process as they execute a routine task.

c) is an especially effective technique for evaluating an expert's performance.

d) is a study of the verbalizations of an individual's thought processes given while executing a problem solving task.

Problem #10

Circle the one answer that best completes the sentence [2 points]

The ability to generate a prototype of a user interface using prototyping tools

a) has seriously undermined the programming morale of software projects.

b) can provide significant cost savings in the design phase of the software project.

c) is important for the effective development of usable user interfaces.

d) has created an entirely new class of interfaces based on graphics and windows.

e) is best described by items b and c above.

Problem #11
Discuss two different ways interfaces should be consistent. That is, what should interfaces be consistent with? [6 points]

Problem #12

What is the difference between <rest of sentence was obliterated>

Problem #13

Briefly describe each of the following prototyping techniques and list a key advantage of each? [12 points]

a) Wizard of Oz

b) Creating paper mock-ups

c) Using an electronic prototyping tool

Problem #14

Briefly discuss the advantages and disadvantages of the menu style of user interface. What is usually used along with it to overcome one of the problems with menus, and why? [5 points]
Problem #15

A design team has two ideas for an interface for expert operators of a new machine for a factory producing hazardous chemicals. To resolve the dispute, they propose to run a user study. Unfortunately, because the product is a secret, they are not allowed to bring in any real users. Therefore, they plan to test each version of the interface on two administrative assistants and see which one is faster to learn. The two versions will be implemented using a widget library and C++. You have been called in as a consultant to advise the team. There are five flaws with this plan. Find and describe each of the flaws and say how each can be fixed in the proposed study. [10 points]

Problem #16

For each of the following evaluation techniques, describe the key information we can learn using each technique and one major disadvantage of each technique. [8 points]

a) Cognitive Walkthrough

b) Heuristic Evaluation

c) GOMS

d) Usability testing
Problem #17

Here is a proposed WWW page containing a form to be used to search for information in a database. Using Nielsen's heuristics, circle and number on the form at least nine violations. Describe each violation below by listing the guideline numbers or titles, but give it some type of title that makes it very clear which guideline you are claiming is violated. [18 points]

Violations
Problem #18

Extra Credit: What school did the Cal men's basketball team play this morning in the NCAA tournament? [1 point]