

January 25, 2005



CMPS 282 Final Exam



American University of Beirut



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Student Name: _____ Student ID: _____

Signature: _____ Section: _____

There are **nine** pages, including this one. The test is out of 100 marks, and the value of each question is provided. Please use this information to manage your time effectively.

Question 1: _____/10
Question 2: _____/10
Question 3: _____/20
Question 4: _____/15
Question 5: _____/35
Question 6: _____/10
Total: _____/100

Question 1: True or False [10 marks]

Answer by placing either a **T** or **F** for True and False, respectively. Incorrect answers incur a penalty at a *floor* (2:1) ratio.

- A) Cyclomatic complexity is proportionally related to testing criteria. ___
- B) A good user interface enhances the transparency of a system's functionalities. ___
- C) Requirements gathering can be incremental in a spiral model. ___
- D) The waterfall model can be applied to systems where requirements are not well known. ___
- E) One of the steps used to complete the component-level design for a software development project is to identify all design classes that correspond to the problem domain. ___
- F) Use-cases provide worthwhile input for interface analysis. ___
- G) Validation testing provides assurance that the software validation criteria (established during requirements analysis) meets all functional, behavioral, and performance requirements. ___
- H) Reducing user memory load is a good GUI design practice. ___
- I) Architecture highlights early design decisions that will have a profound impact on the ultimate success of the system as an operational entity. ___
- J) A good design must implement all explicit requirements from the analysis model and accommodate all implicit requirements desired by the user. ___

Question 3 Analysis and Design [20 marks]

A) What are at least three differences between the analysis model and the design model of a software product? [4 marks]

B) What is a design pattern? [2 marks]

C) Describe the differences, using a good example between the software engineering terms coupling and cohesion? [4 marks]

D) You are to design a class that handles login and security for an application. The basic functions of the class are described in the following three steps:

1. The user must first enter a valid login name. The system checks to see that the name is valid before asking for a password. If it is not valid, the user can either exit (cancel) or re-enter the name.

2. The user then must enter the password associated with the name. The system validates that the password is the appropriate one for the login name. If the password is invalid, the user can either cancel and exit, re-enter the password, or go back to step (1) and re-enter the login name.

3. The user selects a function. The system validates that the function is one that the user is allowed to do. If not, the user can either exit, re-enter the function, or go back to step (1) and start the process over again.

Create a state diagram that describes the above actions. You should name each state (except the start and final state) and the events that trigger the transitions from state to state. **[10 marks]**

Question 4 User Interface Design [15 marks]

A) List three principles that should be applied when building any user interface [3 marks]

B) What framework activities are completed when following an evolutionary (or spiral) user interface development process? [3 marks]

C) List four interface design issues present in the development of most user interfaces. Example "Error information handling" [4 marks].

D) In your opinion, what are the implications of unpredictable response time in a Web GUI? [5 marks].

E) Why is regression testing an important part of any integration testing process? [5 marks]

G) Describe object-oriented unit testing. [5 marks]

H) Describe object-oriented interclass testing, and give a C++ example to illustrate how **du testing can differ from that of intraprocedural **du** testing. [10 marks]**

I) Why is a highly coupled module difficult to test? [5 marks]

Question 6 Component level design [10 marks]

A) Give a brief description of a Component. [5 marks]

B) What does Object-Oriented Component Design focus on? [5 marks]
