

King Saud University  
College of Computer & Information Sciences  
Computer Science Department

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Student ID: <b>Solution</b>	Student Name: .....
<b>Midterm 1:</b> Fall 2010-2011	Saturday November 06, 2010
<b>Module Title:</b> Software Engineering	<b>Module Code:</b> CSC 342
<b>Time Allowed:</b> 1h 30mn	<b>Dr. Salah Hammami</b>

*This exam has three exercises, worth different amounts of points each. You should read through the exam quickly and plan your time management accordingly. Before beginning to answer an exercise, be sure to read it carefully! You must write your answers on the exam.*

**Good luck!**

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**Exercise 1: Multiple Choices** (8 points)

1. Which of the items listed below is not one of the software engineering areas?
  - a. Process
  - b. ~~Manufacturing~~
  - c. Object-Oriented
  - d. Software Tools
2. What are the three generic phases of software engineering?
  - a. definition, evaluation, evolution
  - b. what, how, where
  - c. programming, debugging, maintenance
  - d. analysis, design, coding
3. What types of requirements are elicited during software requirements analysis?
  - a. functional and non-functional
  - b. algorithmic and data structure
  - c. architectural and structural
  - d. usability and reliability
4. The prototyping model of software development is
  - a. A reasonable approach when requirements are well defined.
  - b. A useful approach when a customer cannot define requirements clearly.
  - c. The best approach to use for projects with large development teams.
  - d. A risky model that rarely produces a meaningful product.

5. Which are reasons for adopting an iterative, incremental software development lifecycle over a waterfall lifecycle?
- a. Waterfall is not used much in practice anymore
  - b. [Waterfall does not lower risk as quickly](#)
  - c. Waterfall projects are almost always delivered late
  - d. [Iterative, incremental adopts to changes better](#)
  - e. Iterative, incremental ensures customer participation
6. Which of the following process models best emphasizes risk management?
- a. Waterfall model
  - b. [Spiral model](#)
  - c. Evolutionary model
  - d. Component-based software development
7. Which of the following is not a project management activity?
- a. Project monitoring
  - b. Proposal writing
  - c. [System designing](#)
  - d. Project planning

**Exercise 2: Ethics** (8 points)

- A. A software engineer is employed by the company that designs and manufactures voting machines. She is employed to develop an archival system for retaining voting information and results.

Which of the following actions would most likely be a violation of the Software Engineering Code of Ethics and Professional Practice? Give the Software Engineering Code of Ethics related to your choice?

- a. [She failed to keep adequate documentation of her work on the project.](#)
- b. She has not previously worked on a voting machine project.
- c. She has registered as a voter in the state in which the machines will be used.
- d. She discovered significant number defects in her design for the archival system.

**Answer:**

- a. [She failed to keep adequate documentation of her work on the project.](#)
  - Principle 3: 3.02, 3.11
  - Principle 2: 2.04; 2.06

- B.** You are working on the development of a software and your manager wants to ship the product in one week. You are aware that the securing function still does not work correctly.

According to professional ethics, what are at least three actions you need to do?

**Answer:**

- a) at least he convinced them to delay the delivery of the software,
- b) not complete the project unless his requirements are satisfied,
- c) approve any software that meet specification only.

The software engineering code of ethics 1.03, which states that a software engineer: *“Approve software only if they have a well-founded belief that it is safe, meets specifications, passes appropriate tests, and does not diminish quality of life, diminish privacy or harm the environment. The ultimate effect of the work should be to the public good.”*

**Exercise 3: Requirements** (14 points)

- A.** The following is a running list of possible Game requirements. indicate what type of requirement it is, Functional (F), or Non Functional (NF).
- a. Player chooses a weapon from the weapons they are carrying. (F)
  - b. Combat opponent hits player's character; character loses hit points. (F)
  - c. Game start up  $\leq 30$  seconds. (NF)
  - d. Player hits opponent; compute hit probability. (F)
  - e. Game should respond to key inputs in  $\leq 100$  msec. (NF)
  - f. if response from server  $\geq 2$  second, post a "waiting..." notice in display. (NF)
  - g. if password entered doesn't meet 3-4 rule, don't accept, make user retry. (F)
  - h. All passwords must follow a "3 out of 4" rule (ie, must contain characters from at least three of [a-z][A-Z][0-9] and symbols). (F)
- B.** Given the following description,
- a. Write user requirements.
  - b. Extract each functional and non-functional requirements.

**Description**

The registrar wants to add to their on-line capability by allowing those professors and students with mobile phones, access to the registrar's system. Specifically we want students to be able to view the on-line course catalog and register or un-register for courses, just as they do from their computers. Professors will be able to post grades and obtain class listings. The course catalogs and listings should be able to be downloaded to the mobile so that they can be accessed off-line. Students and professors will have to apply for separate access to the system and will be given a hardware security token (new technology developed at WPI) that will be used to generate unique access sequences for the users. The system must be available at all times and totally secure. After a pilot implementation, we plan to expand the mobile access to the complete WPI on-line capabilities.

**Answer:**

a- User Requirements:

Allow professors and students to access the registrar's system using mobile phones.

b- Functional and non-functional requirements

Requirement	Functional (F)/Non-Functional(NF)
students to be able to view the on-line course catalog	F
students to be able to register or un-register for courses	F
Professors will be able to post grades	F
Professors will be able to obtain class listings	F
The course catalogs and listings should be able to be downloaded to the mobile	F
Apply hardware security token(new technology developed at WPI)	NF
The system must be available at all times	NF
The system must be totally secure	NF
expand the mobile access to the complete WPI on-line capabilities	NF