

Some questions to have an  
insight of exam

# Chapters in the text-book that are less relevant to the exam

- Chapter 3 – Project organization and Communication
- Chapter 12 – Rational Management
- Chapter 13 – Configuration Management
- Chapter 14 – Project Management

# E –questions (must get 75% points from them)

## General questions

**--What are basic ways to deal with complexity?**

**(4p)**

**-- Which of the following are models?**

**a) a UML class diagram**

**b) a set of UML class diagrams describing the classes in a software system**

**c) a 1:100 scale clay replica of a new sports car that will be used to test its aerodynamics in a wind tunnel**

**d) a full-scale, working prototype of a new sports car**

**(4p)**

## UML and OOP

**-- What is/are difference(s) between Sequence diagrams and Communication diagrams?  
When each of them is more appropriate to use?**

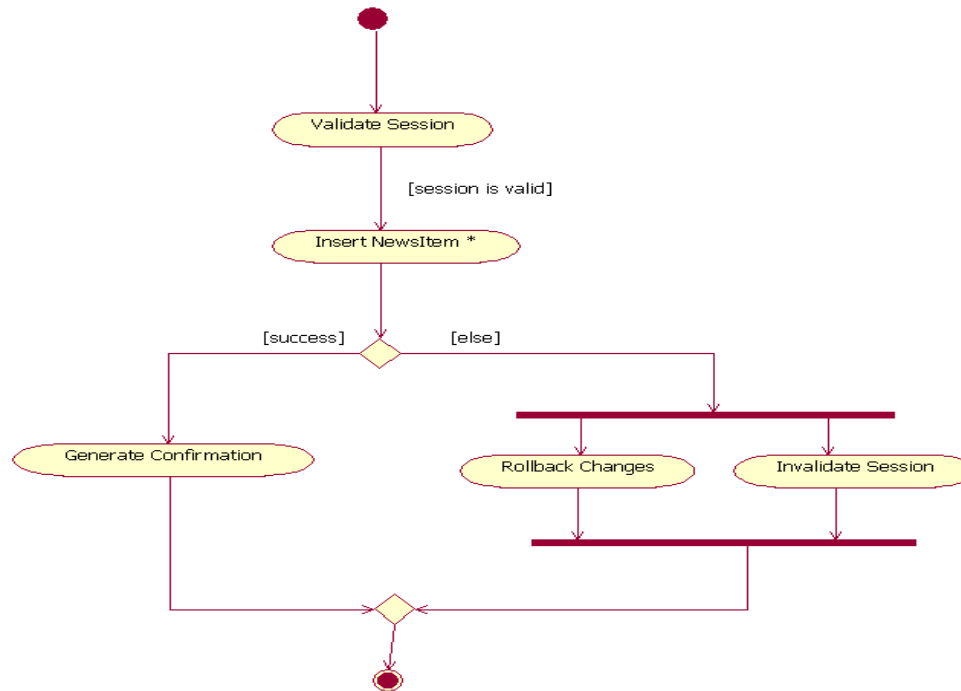
**(3p)**

# E –questions (must get 75% points from them)

--Based on Activity Diagram in Figure 2, which of the following statements are true?

- a) The 'Insert NewsItem' activity is executed many times
- b) The 'Rollback Changes' and 'Invalidate Session, activities are taken in parallel.
- c) The 'Rollback Changes' and 'Invalidate Session, activities are executed many times.
- d) The 'Rollback Changes' and 'Generate Confirmation, activities are taken in parallel
- e) If session is valid then confirmation is generated.

(4p.)



# E –questions (must get 75% points from them)

## System Design

**--Assume that we classified design goals into five categories: performance, dependability, cost, maintenance, and end user. Assign one or more categories to each of the following goals:**

- a) Users must be given a feedback within 1 second after they issue any command.**
- b) The TicketDistributor must be able to issue train tickets, even in the event of a network failure.**
- c) The housing of the TicketDistributor must allow for new buttons to be installed in the event the number of different fares increases.**

**The AutomatedTellerMachine must withstand dictionary attacks (i.e., users attempting to discover an identification number by systematic trial).**

- e) The user interface of the system should prevent users from issuing commands in the wrong order.**

**(4p)**

E –questions (must get 75% points from them)

Moving to Code

-- **Explain the following mapping concepts: model transformation, forward engineering, reverse engineering and refactoring. Draw a figure showing their relations to model space and source code space.**  
**(5p)**

Agile Software Development.

-- **What are main ideas of the Manifesto of Agile Software Development?**

**(5p)**

# More difficult questions

- Why do we apply principle of Falsification in software engineering?  
(5p)**
- Give an explanation of V-Model? What are/is its main difference(s) compare to Waterfall model?  
(5p)**
- Consider an application that must select dynamically an encryption algorithm based on security requirements and computing time constraints. Which design pattern would you select? Draw a UML class diagram depicting the classes in the pattern and justify your choice.  
(5p)**

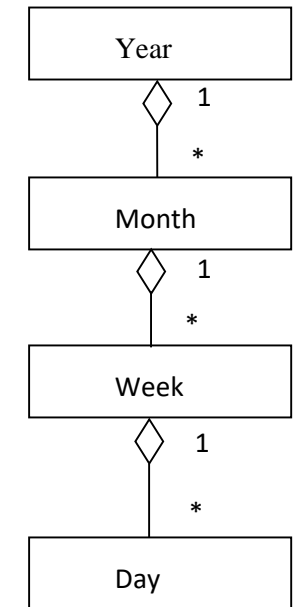
# Most difficult questions

-- Explain what is common and what is different between transformational and deductive synthesis.

(6p)

-- Consider the object model in the Figure. Given your knowledge of the Gregorian calendar, modify the model such that a developer unfamiliar with the Gregorian calendar could deduce the number of days in each month, the number of weeks in each month, the number of months in a year and the number of days in a week? Identify additional classes and associations if necessary.

(6p)





# Most difficult questions

**-- Consider a sorted binary tree data structure for storing integers.**

**Write invariants in OCL denoting that**

- All nodes in the left subtree of any node contain integers that are less than or equal to the current node, or the subtree is empty.**
- All nodes in the right subtree of any node contain integers that are greater than the current tree, or the subtree is empty.**

**(6p)**