

Mansoura University  
Software Engineering (2)  
Date: 13/06/2015  
Final Exam.

Faculty of Computer and Information Sciences  
Third Year Computer Science Department  
Time allowed: 3 hours  
60 points

Answer the following questions:

**Question # 1 (15 points)**

**a.** State whether the following sentences are **TRUE** or **FALSE**, and **CORRECT** the false sentences:

- 1.** REST style is simpler than SOAP/WSDL for implementing web services.
  - 2.** In RTOS , the scheduling processes is considered as solving a concurrency problem.
  - 3.** A component model is a definition of standards for only component implementation, and deployment.
  - 4.** In CBSE, it is impossible for components developed using different approaches to work together.
  - 5.** The deployment time configuration, the product line is adapted and changed according to the requirements of particular customers.
  - 6.** The design process for embedded systems has to consider in detail, only the performance of the system hardware.
  - 7.** Performance testing is a part of system testing.
  - 8.** Design patterns are generic abstractions that occur across applications showing abstract and concrete objects and interactions.
  - 9.** Security engineering is a sub-field of the broader field of computer security.
  - 10.** In service-oriented testing, the behavior of the service is unpredictable because it depends on load.
- b.** Develop a security risk management procedure for an online banking system (transfer balances between accounts, inquires about an account balance, ...)

**Question # 2 (15 points)**

- a.** List at least 6 design guidelines for a secure system engineering.
- b.** Model a state machine for a real-time operating system.

**c.** An organization is developing software using reuse approaches. The organization is supposed to develop a new banking system for customer (A). The organization already developed and deployed a banking system for customer (B), which is with little different requirements than for the customer (A) system. Which software reuse approach that the organization may apply? discuss in details the advantages and disadvantages of using this approach.

**Question # 3 (15 points)**

**a.** Do you think that stakeholders may be involved in service requirements specification? explain your answer, and if "yes", list some stakeholders.

**b.** Give an example of a system that may be developed using ERP architecture. What are the main steps to configure it?

**c.** Explain in details the steps to test a module using guideline-based testing. The module accepts fifteen integers between 100, and 10000, sorts them descendingly, and prints them to the screen.

**Question # 4 (15 points)**

**a.** Discuss the three types of component interface incompatibility problems, give examples of how to solve each of these problems.

**b.** To release a software system, there are three different tests that may be applied. Discuss in details these three tests, and give an example for each.

**c.** A smart home is a home that is equipped with special structured wiring to enable owners to remotely control or program some automated home electronic devices by entering a single command. For example, a homeowner on vacation can use a touchtone phone to enable/disable a home security system, control temperature gauges, control lighting, program a home theater, and perform many other tasks. Give a detailed scenario of how this service may be implemented and used.

**Good Luck**