

Mansoura University
Software Engineering (2)
Date: 09/06/2014
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. The WSDL specification defines only how the service is accessed and where the service is located.
2. The internal state of a component interface is never exposed.
3. The use of standard user interfaces decreases dependability.
4. A hard real-time system is a system which its operation is degraded if results are not produced according to the timing specification.
5. Application frameworks are collections of abstract and concrete objects adapted and extended to create application systems.
6. In a real-time system, the correctness depends only on the time taken to generate a response.
7. Utility services are those associated with some activity.
8. In embedded systems, low-level decisions on hardware, support software and system timing must be considered early in the process.
9. It may be possible for components developed using different approaches to work together.
10. In COTS-integrated systems, system owner is responsible for maintenance, and provides the platform for the system.

b. Design the ‘provides’ interface and the ‘requires’ interface of a reusable component that may be used to represent a patient in a hospital system.

Question # 2 (15 points)

a. What are the main activities in the embedded system design? what are the architectural considerations you may need for real-time systems?

b. What are the fundamental differences between components as program elements and components as services? Explain in details.

c. A system for vacation package reservation service is described as follows: the system books airplane tickets for a passenger or group of passengers. The system also gives the option to reserve a ground transportation (car, taxi, train,..) at the arriving airport. This passenger (or passengers) should be given the option of booking either of these available ground transportation methods. Give a scenario about how a web customer can use this system.

Question # 3 (15 points)

a. Give an overview of the processes in CBSE, and the interaction between them.

b. What does the service engineering process mean? Explain in details how can you link that to the reuse-based software engineering?

c. Using your knowledge of how does the ATM (Automatic Teller Machine) work, present the state machine model of it, show if there is any priority, or interrupt services may be needed.

Question # 4 (15 points)

a. what is the main idea behind having web services standards? List two standards and highlight the main differences between them.

b. What are the main differences between application frameworks and product lines? How can you implement both in software reuse? Justify your answer by giving some examples.

c. Using your knowledge about the weather station system, suggest a product line architecture for a family of applications that are concerned with remote monitoring and data collection. You should present your architecture as a layered model, showing the components that might be included at each level.

Good Luck