

COURSE CODE: ADVANCED SOFTWARE ENGINEERING

MAX. MARKS: 50

COURSE NAME: 10M11CI213

COURSE CREDITS: 3

MAX. TIME: 2 Hr

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*Note: All questions are compulsory.*

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1. [5 + 5]
  - a. Using examples, illustrate the different types of adaptor needed to support sequential composition, hierarchical composition, and additive composition.
  - b. Design the interfaces of components that might be used in a system for an emergency control room. You should design interfaces for a call-logging component that records calls made, and a vehicle discovery component that, given a post code (zip code) and an incident type, finds the nearest suitable vehicle to be dispatched to the incident.
  
2. [5 + 5]
  - a. Reliability and safety are related but distinct dependability attributes. Describe the most important distinction between these attributes and explain why it is possible for a reliable system to be unsafe and vice versa.
  - b. Imagine you are implementing a software-based control system. Suggest circumstances in which it would be appropriate to use a fault-tolerant architecture, and explain why this approach would be required.
  
3. [5 + 5]
  - a. Do I need to give the results of every iteration to my customer? How to do documentation for maintenance, when we want to be agile?
  - b. We want to apply XP, but don't have an onsite customer. What do we do? What are typical risks and mistakes when adopting an iterative process?
  
4. [5 + 5]
  - a. You are responsible for the design of a communications switch that has to provide 24/7 availability, but which is not safety-critical. Giving reasons for your answer, suggest an architectural style that might be used for this system?
  - b. Using a distributed component approach, propose architecture for a national theater booking system. Users can check seat availability and book seats at a group of theaters. The system should support ticket returns so that people may return their tickets for last-minute resale to other customers.
  
5. [5 + 5]
  - a. Imagine a situation where two developers are simultaneously modifying three different software components. What difficulties might arise when they try to merge the changes that they have made?
  - b. Design a process for assessing and prioritizing process change proposals.