

Ref. book : Software Engineering By Ian Sommerville - 8th Edition

For Final:

Socio-technical systems and Critical systems

Software design

Development and Coding

Software testing, Quality management

Software Maintenance

Software Cost Estimation

For Viva:

Introduction

Software design

Development and Coding

Software testing, Quality management

Socio-technical systems

1. A flood warning system is to be procured which will give early warning of possible flood dangers to sites that are threatened by floods. The system will include a set of sensors to monitor the rate of change of river levels, links to a meteorological system giving weather forecasts, links to the communication systems of emergency services (police, coastguard, etc.), video monitors installed at selected locations, and a control room equipped with operator consoles and video monitors. Controllers can access database information and switch video displays. The system database includes information about the sensors, the location of sites at risk and the threat conditions for these sites (e.g., high tide, southwesterly winds), tide tables for coastal sites, the inventory and location of flood control equipment, contact details for emergency services, local radio stations, and so on.

Draw a block diagram of a possible architecture for such a system. You should identify the principal sub-systems and the links between them.

2. Explain why legacy systems can cause difficulties for companies that wish to reorganise their business processes.

Critical systems

1. 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.
2. Is it ethical for an engineer to agree to deliver a software system with known faults to a customer? Does it make any difference if the customer is told of the existence of these faults in advance? Would it be reasonable to make claims about the reliability of the software in such circumstances?

Software design

1. Giving reasons for your answer, suggest an appropriate structural model for the following systems:
 - a. An automated ticket-issuing system used by passengers at a railway station
 - b. A computer-controlled video conferencing system that allows video, audio and computer data to be visible to several participants at the same time
 - c. A robot floor-cleaner that is intended to clean relatively clear spaces such as corridors. The cleaner must be able to sense walls and other obstructions.
2. Your customer wants to develop a system for stock information where dealers can access information about companies and can evaluate various investment scenarios using a simulation system. Each dealer uses this simulation in a different way, according to his or her experience and the type of stocks in question. Suggest a client-server architecture for this system that shows where functionality is located. Justify the client-server system model that you have chosen
3. Explain why distributed systems are inherently more scalable than centralised systems. What are the likely limits on the scalability of the system?
4. Explain why it may be necessary to design the system architecture before the specifications are written.

+ Complete Lecture

Development and Coding

Complete Lecture

Mvc in java

Software testing + verification and validation

1. Discuss the differences between verification and validation. and explain why validation is a particularly difficult process.
2. Explain why it is not necessary for a program to be completely free of defects before it is delivered to its customers. To what extent can testing be used to validate that the program is fit for its purpose?
3. Explain why program inspections are an effective technique for discovering errors in a program. What types of error are unlikely to be discovered through program inspections?
4. Suggest why an organisation with a competitive, elitist culture would probably find it difficult to introduce program inspections as a V &V technique.
5. Explain why testing can only detect the presence of errors, not their absence.
6. What is regression testing? Explain how the use of automated tests and a testing framework such as JUnit simplifies regression testing.
7. Explain why interface testing is necessary even when individual components have been extensively validated through component testing and program inspections.
8. Explain why system testing costs are particularly high for generic software products that are sold to a, very wide market.

+ Complete Lecture

Quality management+ Software Maintenance

1. Explain why a high-quality software process should lead to high-quality software products. Discuss possible problems with this system of quality management.
2. Explain how standards may be used to capture organisational wisdom about effective methods of software development. Suggest four types of knowledge that might be captured in organisational standards.
3. Under what circumstances do you think that software should re-engineered rather than re-written?

+ **Complete Lecture**

Software cost estimation

1. Under what circumstance might a company charge a much higher price for a software system than that suggested by the cost estimate plus a normal profit margin?
2. Is it ethical for a company to quote a low price for a software contract knowing that the requirements are ambiguous and that they can charge a high price for subsequent changes requested by the customer?
3. A defect, which could have been removed during the initial stage, is removed in a later stage. How does this affect the cost?

+ **Complete Lecture**