

Requirements engineering 2

Name:

1. What are the primary dependability attributes of a system?

Availability
Reliability
Safety
Security

2. Under what circumstances can unreliability be tolerated?

When it is (a) easy to detect that a problem has occurred
(b) cheap and quick to recover from the problem

3. Describe the three types of dependability requirement?

Exclusion requirements that define undesirable situations to be avoided
Functional requirements that protect against system failure
Non-functional requirements that define levels of availability and reliability

4. List 4 types of security requirement?

Identification requirements, authentication requirements, authorisation requirements, immunity requirements
Integrity requirements, intrusion detection requirements, non-repudiation requirements, privacy requirements
Security auditing requirements, system maintenance security requirements

5. What are the two principal metrics used to specify reliability?

Probability of failure on demand
Rate of occurrence of failure

6. Under what circumstances would Mean Time to Failure be an appropriate reliability metric?

This is an appropriate metric for systems that handle 'long transactions'. In those cases, the time between system failures should significantly exceed the 'average' length of a transaction.

7. What are the problems with specifying availability as a simple percentage?

Does not take periods of degraded operation into account.

Can be satisfied in different ways, some of which may be unacceptable to the system provider and users.

8. Explain why probability of failure on demand is the most appropriate metric for specifying the reliability of a train protection system?

Because this system is used intermittently and relatively infrequently rather than continuously. ROCOF depends on continuous operation of a system.