



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Advances in Software Engineering (25CS5812)

Year & Sem: I/II

Course & Branch: M.Tech - CSE

UNIT-I

Regulation: R23

SOFTWARE PROCESS AND PROJECT MANAGEMENT

1	a)	Explain Software Engineering as a layered technology with a neat diagram.	[L2][CO1]	[5M]
	b)	Write the advantages and disadvantages of the Waterfall model.	[L1][CO1]	[5M]
2		Explain the Spiral Process Model with a neat diagram and discuss its advantages and limitations.	[L2][CO1]	[10M]
3	a)	What is the Evolutionary Process Model? Explain its types.	[L1][CO1]	[5M]
	b)	Explain the Unified Process Framework.	[L2][CO1]	[5M]
4		Explain software project estimation techniques such as LOC, Function Points, and COCOMO.	[L2][CO1]	[10M]
5		Discuss software project scheduling and explain Gantt charts and PERT charts.	[L1][CO1]	[10M]
6		Explain risk management in software projects including identification, analysis, and mitigation.	[L2][CO1]	[10M]
7		Explain Capability Maturity Model Integration (CMMI) and describe its maturity levels.	[L2][CO1]	[10M]
8		Explain the Unified Process Framework and describe its phases: i) Inception ii) Elaboration iii) Construction iv) Transition	[L2][CO1]	[10M]
9		Discuss ISO standards for software quality and process improvement.	[L1][CO1]	[10M]
10		Explain the role of process improvement models like CMMI in software organizations.	[L2][CO1]	[10M]

REQUIREMENTS ENGINEERING AND MODELING

1	a)	Define Requirement Engineering and explain its importance in software development.	[L1][CO2]	[5M]
	b)	What is Requirement Elicitation? Describe common elicitation techniques.	[L1][CO2]	[5M]
2		Discuss the Requirement Specification process and explain the structure of a Software Requirement Specification (SRS) document.	[L1][CO2]	[10M]
3		Explain the Requirement Validation process and describe techniques used to ensure requirement correctness.	[L2][CO2]	[10M]
4		Explain the Requirement Engineering tasks with a neat diagram showing their relationships.	[L2][CO2]	[10M]
5		Discuss UML (Unified Modeling Language) and explain its importance in system modeling.	[L1][CO2]	[10M]
6		Explain Flow-oriented modeling and discuss Data Flow Diagrams (DFD) with symbols and examples.	[L2][CO2]	[10M]
7	a)	Explain Scenario-based modeling and describe Use Case Diagrams with an example	[L2][CO2]	[5M]
	b)	Define architectural styles and patterns.	[L1][CO2]	[5M]
8		Describe Behavioral modeling and explain state diagrams and sequence diagrams	[L1][CO2]	[10M]
9		Explain Class-based modeling and describe class diagrams, attributes, and relationships.	[L2][CO2]	[10M]
10		Discuss the principles of good software design and explain how they improve software quality.	[L1][CO2]	[10M]

UNIT-III
ADVANCED DESIGN AND DEVELOPMENT CONCEPTS

1	a)	Define Component-Level Design in software engineering? Explain it?	[L2][CO3]	[5M]
	b)	Explain the objectives of component-level design.	[L2][CO3]	[5M]
2	a)	Explain the Object-Oriented Design (OOD)?	[L2][CO3]	[5M]
	b)	Analyze the importance of UML class diagrams in design.	[L4][CO3]	[5M]
3		Explain Component-Level Design and describe the steps involved in designing software components.	[L2][CO3]	[10M]
4		Discuss the principles of component-level design and explain how they improve software quality.	[L1][CO3]	[10M]
5		Explain design patterns and discuss their importance in object-oriented software development.	[L2][CO3]	[10M]
6		Describe different types of design patterns with suitable examples.	[L1][CO3]	[10M]
7		Explain the Singleton, Factory, and Observer design patterns with examples.	[L2][CO3]	[10M]
8		Explain the concept of software frameworks and describe their advantages in application development.	[L2][CO3]	[10M]
9	a)	Explain the importance of coupling and cohesion in component-level design.	[L2][CO3]	[5M]
	b)	Discuss the relationship between component-level design and architectural design.	[L1][CO3]	[5M]
10		Explain Reuse-Oriented Software Engineering and discuss its importance in modern software development.	[L2][CO3]	[10M]

UNIT –IV
SOFTWARE QUALITY, TESTING AND MAINTENANCE

1	a)	Define software quality and explain its importance	[L2][CO4]	[5M]
	b)	Explain Software Quality Assurance (SQA).	[L2][CO4]	[5M]
2		Explain software reviews and describe the process of Formal Technical Reviews (FTR)	[L2][CO4]	[10M]
3	a)	Discuss the the benefits of software reviews?	[L2][CO4]	[5M]
	b)	Explain the software testing strategy.	[L2][CO4]	[5M]
4	a)	What is Unit Testing in software testing? Explain it?	[L2][CO4]	[5M]
	b)	Explain Integration Testing with an example.	[L2][CO4]	[5M]
5		Explain Black - box testing techniques with suitable examples.	[L2][CO4]	[10M]
6		Explain White-box testing techniques and describe their advantages.	[L2][CO4]	[10M]
7		Discuss the importance of software maintenance in the software life cycle.	[L2][CO4]	[10M]
8		Discuss the software reengineering process and explain its activities.	[L2][CO4]	[10M]
9		Explain how quality assurance activities are integrated into the software development process.	[L2][CO4]	[10M]
10		Discuss the challenges involved in software testing and maintenance.	[L2][CO4]	[10M]

UNIT –V
ADVANCED TOPICS AND EMERGING TRENDS

1	a)	Explain advanced topics in software engineering.	[L2][CO5]	[5M]
	b)	Explain cloud computing in software development.	[L2][CO5]	[5M]
2	a)	Explain continuous integration (CI) in software development.	[L2][CO5]	[5M]
	b)	Analyze the continuous deployment (CD) in software development.	[L3][CO5]	[5M]
3		Discuss DevOps practices and explain how DevOps improves collaboration between development and operations teams.	[L2][CO6]	[10M]
4		Discuss microservices architecture and explain its advantages compared to monolithic architecture.	[L2][CO6]	[10M]
5		Explain containerization technology and its importance in application deployment.	[L2][CO6]	[10M]
6		Explain blockchain technology and its significance in secure software systems.	[L2][CO6]	[10M]
7		Explain how digital transformation is influencing software engineering practices.	[L2][CO6]	[10M]
8		Discuss the future scope of advanced technologies in software engineering.	[L2][CO6]	[10M]
9	a)	What is big data in software engineering? Explain it.	[L2][CO6]	[5M]
	b)	Explain the role of cybersecurity in modern software systems.	[L2][CO6]	[5M]
10		Explain how AI-driven tools are changing software testing and development processes.	[L2][CO6]	[10M]

Prepared by: Dr. K. Hemabala