**Sipna College of Engineering and Technology, Amravati**

**Department of Information Technology**

**Session 2025-26**

**Year/Sem: Third/ V sem**

**Subject: Software Engineering**

**Question Bank (All 6 Units)**

**UNIT 1**

1. Illustrate various characteristics of Software and explain various software myths.
2. Explain evolving role of software.
3. Elaborate Software Engineering a layered technology.
4. Explain Software Process and explain the common process framework.
5. Explain the following models in detail with advantages and disadvantages:
6. Linear Sequential
7. Prototyping
8. RAD
9. Incremental
10. Spiral
11. WinWin Spiral
12. Concurrent and Component based model
13. Define Software as Product and Software as Process. Explain in detail.
14. Explain the project management spectrum (4P’s) in detail.
15. Illustrate W5 HH Principle and critical practices in detail.
16. Explain five level of CMMI that are required to achieve maturity levels.
17. Justify statement “Software is a logical rather than a physical system element”. What are the characteristics of software that are considerably different than those of hardware.
18. Define “Software” as a product. What are different types of “Software Applications”? Explain the evolving role of Software.
19. Explain why programs which are developed using evolutionary development model, likely to be difficult to maintain.

**UNIT 2**

1. Illustrate the use of Metrics in the Process and Project Domains.
2. Explain the following:
3. Size oriented metric
4. Function oriented metric
5. Extended Function Point Metrics
6. Software sizing and its approaches
7. Explain the following:
8. Software project planning
9. Resources with resource pyramid
10. Software Project estimation
11. Risk Management, Risk Projection, Risk information sheet
12. Types of Software Measurement
13. Measure, metrics and indicators with its use
14. Reusable software components
15. Correctness and maintainability
16. RMMM Plan
17. Describe the difference between risk components and risk drivers.
18. What are the determinants for software quality and organizational effectiveness.
19. How do we assess the consequences of a risk? Explain.
20. What is risk mitigation, monitoring, and management? Explain.
21. What is risk identification.
22. Explain project resources in detail.
23. What are various Software Risks? Explain in detail.
24. Differentiate between:
    1. Process and Project Matrices.
    2. Size-oriented and function-oriented matrices.
    3. Process and Project indicators
    4. Direct and Indirect measures
25. Explain in detail risk refinement.
26. State and explain the measures of software quality.
27. Explain the function-oriented metrics and also explain how function points are calculated.
28. List different metrics for software measurement and explain any one of them.
29. Define measure, measurement and metrics. What are process and project metrics.
30. Explain how DRE for a software product and project is calculated? Give an example.
31. What are the contents of software project planning? State the importance of software project plan?

**UNIT 3**

1. What is software configuration management (SCM)?
2. Explain guidelines for formal technical review.
3. What are various activities involved in SQA (Software Quality Assurance)? Explain in detail.
4. What is degree of Rigor? Explain different degree of rigor.
5. Explain project scheduling in detail.
6. Explain Earned Value Analysis.
7. Explain SQA in detail.
8. Elaborate on the relationship between “People” and “Effort”.
9. Explain the empirical relationship between number of lines of code delivered, efforts and development time.
10. What is quality assurance program checklist?
11. Explain with example how timeline charts help in scheduling a software product.
12. Explain two software reviews in details.

**UNIT 4**

1. Define software prototyping. State software specification principles.
2. Explain the throw away and evolutionary prototyping.
3. Explain Design Process and Principles.
4. Explain in detail System Modelling?
5. What is "Software Prototyping"? State the software specification principles
6. What are guidelines principles for Requirement Engineering?
7. Explain in detail concept of Requirement Engineering?
8. What is system Engineering Hierarchy? Explain the Business Process Engineering Hierarchy?
9. What is Quality Function Development? What are the types of requirements QFD identifies? Explain.
10. State & explain principles of analysis.
11. What is Refinement? How it is beneficial to create detailed project schedule?
12. Explain the various concept of Effective Modular Design? Explain anyone.
13. Explain with the help of neat sketch how an analysis model can be translated into a software design that is design model.
14. Explain the relationship between modularity and software cost.
15. Explain the task analysis and modeling.
16. Explain Close Ended and Open-Ended prototyping.
17. Explain how requirement engineering bridges between system engineering and software design?
18. Explain in detail:
    1. Partitioning in detail
    2. Quality function deployment
    3. Cohesion
    4. Effective modular design
19. Why do software development projects generate so much documentation.

**UNIT 5**

1. Explain Software Architecture in detail.
2. What is component level design? Explain.
3. What are the design steps used in transform Mapping? Explain them in brief.
4. Explain the golden rule for User Interface Design.
5. Explain Architectural Styles & Patterns in detail.
6. Explain the interface design evolution cycle in detail.
7. Explain the basic steps
   1. Transaction mapping
   2. Transform Mapping
8. Why is “Chunking” important during the component level design Review process? Explain.
9. Explain structure programming.
10. What are the mapping requirements into the software architecture?
11. Explain user interface design process in detail.
12. Explain task analysis and modelling in detail.
13. Describe the different evaluation criteria applied when a design model interface has been created.
14. Explain the following:
    1. Tabular design notation
    2. Program design language
15. Why is high cohesion and low coupling necessary in effective modular design.
16. Explain design steps for transaction mapping.
17. Explain data centered architecture and data flow architecture.

**UNIT 6**

1. Explain white box testing and black box testing.
2. Define software testing. State its objectives and principles.
3. Explain loop testing with its four different classes.
4. Describe integration testing in detail. Explain top-down and bottom-up integration.
5. What is debugging? What are the bug removal considerations?
6. State and explain primary objective of testing.
7. What is smoke testing? Explain in brief.
8. Explain backtracking and cause elimination.
9. Explain why regression testing is necessary.
10. Explain the terms:
11. Verification
12. Validation
13. Cyclomatic Complexity
14. Debugging