SOFTWARE ENGINEERING

SECTION A: Short Questions

1. What do you understand by software crisis?
2. What are different software quality attributes?
3. Write the difference between verification and validation.
4. What is Decision Tree?
5. Write principles of Software Design.
6. What is Pseudo Code? How it differs from Algorithm?
7. Explain Code Inspection.
8. What are stub and driver?
9. Define CASE tools.
10. What is Adaptive and Corrective Maintenance?
11. List the process maturity levels in SEI's CMM.
12. Compare evolutionary and throwaway prototyping.
13. Draw the Context level DFD for the Safe home Software.
14. Distinguish between horizontal and vertical partitioning.
15. Write short notes on equivalence partitioning.
16. Define software re-engineering.
17. Enlist characteristics of software.
18. Define SDLC.
19. Compare ISO 9000 and SEI-CMM.
20. Examine methods of finding cyclomatic complexity with example.
21. Explain Function-oriented Design.
22. Differentiate between adaptive and corrective maintenance.
23. Differentiate between software Re-engineering and Reverse engineering.
24. Discuss the various characteristics of a software.
25. Explain the need of an SRS.
26. Discuss LOC? List two advantages and disadvantages of LOC.
27. Describe the importance of white box testing.
28. Explain Error, Fault, and Failure.
29. List any two reasons for the increase in software costs.
30. Discuss the need for Risk Management in software engineering.

SECTION B: Descriptive Questions

1. Explain Spiral Model? Also, write its advantages and disadvantages.
2. Explain CMM Model. Compare ISO and CMM.
3. Explain different methods of verification in detail.
4. What is Structure Chart? Explain different basic blocks used to build a structure chart with a suitable example.
5. What is cost analysis in the context of software? Explain COCOMO Model.
6. Explain iterative waterfall and spiral model for the software life cycle and discuss various activities in each phase.
7. Describe how software requirements are documented? State the importance of documentation.
8. Explain data architectural and procedural design for software.
9. Describe decomposition levels of abstraction and modularity concepts in software design.
10. Define black box testing strategy. What do you mean by integration testing? Explain their outcomes.
11. Explain prototyping model of SDLC. What are its advantages over conventional model? Explain with a diagram.
12. Create a level-2 DFD of the Smart College Campus.
13. Differentiate between the features of Top-down and Bottom-up approaches of software design along with its advantages and disadvantages.
14. What is regression testing? Discuss the process of test case prioritization in regression testing.
15. Why is Software maintenance required? Explain types of maintenance with examples.
16. Illustrate the statement “Software engineering is layered technology”.
17. Discuss the importance of Feasibility Study. Also, discuss its various types.
18. Explain Code Inspection, Formal Technical Reviews (Peer Reviews), and Walk Through in detail.
19. Write a short note on:

- Mutation testing
- Alpha & Beta testing
- Regression testing

20. What do you mean by the term software re-engineering? Why is it required?

SECTION C: Long Answer Questions

1. Explain different phases of SDLC.
2. Explain Iterative Enhancement Model. Write its advantages and disadvantages.
3. What do you understand by DFD? Explain basic blocks, which are used to build DFD with a suitable example.
4. What is SRS? Explain characteristics of a good SRS.
5. What is the objective of software design? Explain different approaches for software design.
6. What is Cyclomatic complexity? Write all methods, which are used to calculate the Cyclomatic complexity of a control flow graph.
7. What is Regression Testing? Explain the process of test case prioritization in regression testing.
8. What is Integration Testing? Explain different approaches used for integration testing.
9. Explain various software configuration management activities.
10. Explain Software Risks Analysis and Management process.
11. List several software process paradigms. Explain how both waterfall model and prototyping model can be accommodated in the spiral process model.
12. Which is more important—the product or process? Justify your answer.
13. Explain the feasibility studies. What are the outcomes? Does it have either implicit or explicit effects on software requirement collection?
14. Narrate the importance of software specification of requirements. Explain a typical SRS structure and its parts.
15. Explain about the various design concepts considered during design.
16. What are the characteristics of a good design? Describe different types of coupling and cohesion. How is design evaluation performed?
17. What do you mean by boundary value analysis? Give two examples of boundary value testing.
18. What do you mean by system testing? Explain in detail.
19. Explain the need for software measures and describe various metrics.
20. Write briefly on:

- CASE
- Software complexity measure.

21. Discuss Spiral Model for Software development life cycle and highlight the Risk analysis in this context.
22. What is the need of SDLC? Discuss evolutionary development model in detail with the help of a diagram.
23. Discuss about decision tables and its components. Create a decision table for the following scenario: a bookstore gets a trade discount of 25% for orders more than 6 books; for orders from libraries and individuals, 5% allowed on orders of 6-19 copies per book title; 10% on orders for 20-49 copies per book title; 15% on orders for 50 copies or more per book title.

24. Discuss the importance of software specification Document. And also explain the typical IEEE format of SRS document.
25. With the help of an example, illustrate the concept of modularity and discuss why “Low coupling – High cohesion is better for good software” along with the concept of functional independence.
26. What are the various software design strategies? Analyze the points of difference between Function Oriented Design and Object-Oriented Design.
27. Explain Halstead software metrics in detail and mention what do you understand by token count?
28. Discuss the differences between black box and white box testing and explain how these techniques can be used simultaneously to test a system.
29. Explain Risk management in detail. Also, discuss the points that differentiate project risk from technical risk.
30. What is cost analysis in the context of software? Explain COCOMO model with the help of a schematic diagram.
31. Explain Software Quality Attributes in detail.
32. Explain SDLC. Also, discuss various activities during SDLC.
33. Explain Requirement Elicitation techniques in detail.
34. Compare SEI CMM Model and ISO 9000 Model. Also, discuss five levels of CMM.
35. Explain the term Cohesion and Coupling? Also, explain the various forms of cohesion and coupling?
36. Explain software metric? Also, explain the various metrics for the size estimation of a project.
37. A program reads an integer number within the range [1,100] and determines whether it is a prime number or not. Design test cases for this program using BVC, robust testing, and worst-case testing methods.
38. What is Integration Testing? Explain different approaches used for integration testing.
39. Discuss the need for maintenance. Also, discuss various categories of maintenance.
40. Discuss COCOMO model in detail. Also, explain the term Person Month (PM).