

15CS42: SOFTWARE ENGINEERING

QUESTION BANK

MODULE 1.

1. What is software? Explain the two fundamental types of software products.
2. What is software engineering? What is the difference between software engineering and computer science?
3. What is the difference between software engineering and system engineering?
4. What are the professional and ethical responsibilities a software engineer should have?
5. List and explain the different types of applications. Write short note on Software Engineering Diversity.
6. With an example of a system explain the concepts such as dependability, system modelling and reuse.
7. What is a software process?
8. What is a software process model? Explain the types of process models.
9. List and explain the fundamental activities of software engineering. What are the basic process activities common across all development processes.
10. Explain with a neat diagram Waterfall model.
11. Explain with a neat diagram Incremental Model.
12. Explain reuse-oriented software engineering.
13. 18. How is Spiral Model different from other process models? Explain with a diagram.
19. Compare and contrast between Water Fall Model and Spiral Development Model.
20. Explain how both waterfall model and prototyping model can be accommodated in the spiral process model.
21. With a neat diagram explain testing phases in a plan driven software process.

MODULE 2.

1. Explain briefly the different types of system models that might be created during the system analysis phase.
2. Write short notes on

- a. Context models
 - b. Behavioral models
 - c. Interaction models
 - d. Structural models
3. Explain MDA.
 4. Explain with a neat diagram MDA transformations.
 5. Explain, with a neat diagram, the distinct phases of Rational Unified Process (RUP).
 6. List the best practices followed in RUP.
 7. Explain use case model for weather station.
 8. Explain high level architecture of weather station.
 9. List and explain the different stages involved in the object oriented design process.
 10. What is an object? Explain with an example.
 11. Explain in detail the object identification process.
 12. Distinguish between an object and an object class. Give example.
 13. Illustrate with two examples for object and object class.
 14. Draw and explain state diagram for a typical weather information system.
 15. Draw and explain sequence diagram for describing data collection in weather information system.
 16. What is design patter? List and explain four essential elements of design patterns.
 17. Explain how software can be reused at different levels.
 18. List the fundamental SCM activities.
 19. Write short note on Host-Target Development.
 20. Write short note of Open Source Development.

MODULE 3

1. List the goals of testing./Explain two distinct goals of software testing.
2. Bring out the meaning of verification and validation clearly with an example. Explain the ultimate goal of the verification and validation process.
3. Define validation and verification and explain two complementary approaches to system checking and analysis.
4. What are the advantages of software inspection over testing.
5. With a neat diagram explain the model of software testing process.
6. With a neat diagram, explain the debugging process.
7. Explain in detail the software inspection process.

8. Write short notes on system testing, Unit Testing and Component Testig.
9. Explain the various approaches one can take to designing test cases.
10. Explain with a neat diagram, explain the test driven development.
11. What are the benefits of test driven development.
12. What is equivalence partitioning? Explain with an example how equivalence partition helps in testing.
13. Write a short note on requirement based testing and scenario based testing.
14. Briefly explain Performance Based testing.
15. List and explain types of User Testing.
16. With a neat diagram explain Acceptance Testing Process.
17. With a neat diagram explain spiral model of development and evolution.
18. With a neat diagram explain software evolution process.
19. List and explain Lehman's laws related to software evolution.
20. What are the different types of software maintenance?
21. What are the key factors which distinguish software development and maintenance?
22. Write short notes on maintenance prediction.
23. With a neat diagram, explain the software change identification and evolution processes.
24. Explain the software re-engineering process, with an illustrative figure.
25. Explain why software maintenance is more expensive than development.
26. List and explain the distinct process metrics that can be used for assessing maintainability.
27. Write short notes on preventative maintenance by refactoring.
28. List and explain the strategic options of Legacy System Management.
29. Explain the various factors that are used in environment assessment.
30. Explain the distinct factors used in application assessment.

MODULE 4

1. What are the stages of project planning.
2. List and explain the factors affecting software pricing.

3. Explain a typical project plan structure.
4. With a neat diagram explain project planning process.
5. List and explain project plan supplements.
6. With a neat diagram explain project scheduling process.
7. For the set of tasks shown below draw the project scheduling using
 - i) Activity Chart
 - ii) Gantt/Bar Chart
 - iii) Staff allocation versus time chart.
 Assume start date of project as 01 Mar 2015

| Task | Duration | Dependency |
|------|----------|------------|
| T1 | 8 | |
| T2 | 15 | |
| T3 | 15 | T1(M1) |
| T4 | 10 | |
| T5 | 10 | T2, T4(M2) |
| T6 | 5 | T1, T2(M3) |
| T7 | 20 | T1(M1) |
| T8 | 25 | T4(M4) |

8. Explain cost estimation techniques.
9. Describe the COCOMO model of software cost estimation.
10. List and explain the distinct scale factors used in exponent competition in the post architecture model.
11. Write a short note on project duration and staffing.
12. What are the three principles of software quality management.
13. Explain the structure of software quality plan.
14. List and explain software quality attributes.
15. With a neat diagram explain process based quality.
16. With a neat diagram explain the software review process.
17. List and explain the various checks that could be made during the inspection process.
18. With a neat diagram explain prediction and control measurements.
19. What are the distinct types of product metrics.
20. List and explain distinct static software product metrics.
21. List and explain distinct object oriented metrics.
22. With a neat diagram explain the process of product measurement.
23. Write a short note on measurement ambiguity.

MODULE 5

1. Explain with a neat diagram system evolution process.
2. With a neat diagram explain system evolution.
3. What is prototype? With a neat diagram explain the process of prototype development.
4. With a neat diagram explain Incremental Delivery Model.
5. List the advantages and disadvantages of Incremental Delivery Model.
6. Explain the Boehm's spiral model of software development, with a neat diagram.
7. With a neat diagram explain Extreme Programming release cycle.
8. List and explain principles or practices of extreme programming practices.
9. Write a short note on Testing in XP.
10. List and explain the advantages of pair programming.
11. With a neat diagram explain plan driven and agile specification.
12. Explain the scrum process.
13. How is large software system development different from small system development.
14. Explain the factors that make it difficult to introduce agile methods into large companies.
15. List and explain the various roles in Scrum Process.
16. Explain the Product Backlog in Scrum.
17. Write short notes on Sprint Planning, Daily Scrum, Sprint Review, Sprint Retrospective.

