Module 1: Introduction; Software Processes; Requirements Engineering

1. What are the Advantages of incremental model?
2. Which process model leads to software reuse? Why?
3. Explain the IEEE Standard Requirement Document with its structure.
4. Illustrate requirement engineering process with a neat diagram
5. Differentiate functional and non functional requirements
6. What is Requirement Specification? Explain different ways of writing system requirements
7. What is ethnography? How ethnography is effective in discovering the type of requirements?
8. With a diagram explain Spiral process model.
9. Explain Requirement elicitation and analysis process
10. Indicate why requirement validation is needed. Discuss different checks to be carried out during requirement validation process.
11. List and explain the different types of Application software
12. What are the fundamental software process activities? With neat diagram explain requirement engineering process.
13. Give at least two reasons for prototyping is problematic.
14. Consider you are hired for a company and the company wants you to provide software solutions to customers, categorize the different types of software you would come up with by giving real time example of these categories.
15. Mention the Advantage and Disadvantage of waterfall model.
16. List & Explain the task regions in the spiral model.
17. Assume that you need to develop software for the e-commerce web site what type of model is preferred for the development and why? Explain the model applied with a figure.
18. Explain with two examples of software development projects would be amenable to evolutionary prototyping. Why is evolutionary prototyping suitable in these cases?
19. Develop the requirement engineering process, Give an example and list of ways to collect the requirements.
20. Which is more important-the product or process? Justify your answer
21. Explain the Waterfall and Incremental Model. What are the Advantages and Disadvantages?
22. Explain Component Based Development model in detail.
23. Mention any two non-functional requirements on software to be developed.
24. What is meant by Requirement management?
25. What is meant by software prototyping?

26. Classify and explain the ethics followed during the software development process.
27. To help counter terrorism, many countries are planning or have developed computer systems that track large numbers of their citizens and their actions. Clearly this has privacy implications. Discuss the ethics of working on the development of this type of system.
28. Suggest why it is important to make a distinction between developing the user requirements and developing system requirements in the requirements engineering process.
29. Explain why Boehm's spiral model is an adaptable model that can support both change avoidance and change tolerance activities. In practice, this model has not been widely used. Suggest why this might be the case.
30. Using the technique suggested here, where natural language descriptions are presented in a standard format, write plausible user requirements for the following functions:
    a. An unattended petrol (gas) pump system that includes a credit card reader. The customer swipes the card through the reader then specifies the amount of fuel required. The fuel is delivered and the customer's account debited.
    b. The cash-dispensing function in a bank ATM.
31. Discover ambiguities or omissions in the following statement of requirements for part of a ticket-issuing system: An automated ticket-issuing system sells rail tickets. Users select their destination and input a credit card and a personal identification number. The rail ticket is issued and their credit card account charged. When the user presses the start button, a menu display of potential destinations is activated, along with a message to the user to select a destination. Once a destination has been selected, users are requested to input their credit card. Its validity is checked and the user is then requested to input a personal identifier. When the credit transaction has been validated, the ticket is issued.
32. Who should be involved in a requirements review? Draw a process model showing how a requirements review might be organized.
33. Using your knowledge of how an ATM is used, develop a set of use cases that could serve as a basis for understanding the requirements for an ATM system.

Module 2: Software Process Models, Testing

34. Explain why it is important to model the context of a system that is being developed. Give two examples of possible errors that could arise if software engineers do not understand the system context.
35. Demonstrate the working model of the Mental Health system.

36. You have been asked to develop a system that will help with planning large-scale events and parties such as weddings, graduation celebrations, birthday parties, etc. Using an activity diagram, model the process context for such a system that shows the activities involved in planning a party (booking a venue, organizing invitations, etc.) and the system elements that may be used at each stage.
37. With an activity diagram demonstrate the working model for the insulin delivery system
38. For the MHC-PMS, propose a set of use cases that illustrates the interactions between a doctor, who sees patients and prescribes medicine and treatments, and the MHC-PMS.
39. Using the example of an ATM withdrawal, outline the main steps and interactions involved in the use case, and then create a corresponding sequential model (sequence diagram)
40. Look carefully at how messages and mailboxes are represented in the e-mail system that you use. Model the object classes that might be used in the system implementation to represent a mailbox and an e-mail message.
41. Demonstrate using data driven model for the insulin pumps operation.
42. Draw state diagrams of the control software for: A telephone answering system that records incoming messages and displays the number of accepted messages on an LED. The system should allow the telephone customer to dial in from any location, type a sequence of numbers (identified as tones), and play any recorded messages.
43. You are a software engineering manager and your team proposes that model-driven engineering should be used to develop a new system. What factors should you take into account when deciding whether or not to introduce this new approach to software development?
44. What are the various software architectures available for the developer according to you? Which is the best and why?
45. Distinguish between verification and validation:
46. Why testing is important with respect to software?
47. Explain Links , associations. Explain UML notation for same with example.
48. What is generalisation and association?
49. With help of class diagram define multiplicity, association and names.
50. With a neat diagram explain the phases in the Rational Unified Process (RUP)
51. What is model driven Engineering? State the three types of abstract system model produced with a neat diagram
52. With neat diagram, explain six stages of acceptance testing process
53. What are the different types of interfaces to be tested during component testing ? Explain.
54. Explain why testing can only detect the presence of errors, not their absence.

55. Some people argue that developers should not be involved in testing their own code but that all testing should be the responsibility of a separate team. Give arguments for and against testing by the developers themselves.
56. Explain regression testing?
57. What are the benefits of involving users in release testing at an early stage in the testing process? Are there disadvantages in user involvement?
58. Discuss Test Driven Development with its process and list its benefits.
59. Explain Event driven modelling. With a state diagram of microwave oven application.

Module 3: Project management, Project Planning, Quality management

60. Explain the different stages of project planning in a product life cycle.
61. List and explain the common risks faced in the stages of project development
62. List and explain the different phases of risk management
63. Categorize the different types of risk identified in the risk management process
64. How identified risks are analyzed.
65. Identify the different strategies used to manage risks
66. List and explain the critical factors in people management
67. With a figure explain Human needs hierarchy
68. Classify and explain the different personality types
69. List the different benefits of creating a cohesive group
70. Explain the different strategies to be followed while selecting group members
71. List out the Important organizational questions that the project managers must include.
72. List and explain the different factors that influenced communication.
73. Explain why keeping all members of a group informed about progress and technical decisions in a project can improve group cohesiveness.
74. With a neat diagram explain the project planning process
75. Discuss project plan. Explain the various sections of project plan.
76. With a neat diagram explain the project scheduling process.
77. For the set of tasks shown in the below table draw the activity bar chart for the project scheduling

Task	Effort (person-days)	Duration (days)	Dependencies
T1	15	10	
T2	8	15	
T3	20	15	T1(M1)
T4	5	10	
T5	5	10	T2,T4(M3)

T6	10	5	T1,T2(M4)
T7	25	20	T1(M1)
T8	75	25	T4(M2)
T9	10	15	T3,T6(M5)
T10	20	15	T7,T8(M6)
T11	10	10	T9(M7)
T12	20	10	T10, T11(M8)

78. For the set of tasks shown in the below table draw the activity bar chart for the project scheduling

Task	Duration (days)	Dependencies
T1	10	
T2	15	T1
T3	10	T1, T2
T4	20	
T5	10	
T6	15	T3, T4
T7	20	T3
T8	35	T7
T9	15	T6
T10	5	T5,T9
T11	10	T9
T12	20	T10
T13	35	T3, T4
T14	10	T8, T9
T15	20	T2, T14
T16	10	T15

79. Explain the different project estimation techniques
80. Discuss software quality and its attributes. Explain process based quality.
81. Explain project standards and process standards in software quality management
82. Identify the different phases of software review process
83. Explain the various inspection checks in the program inspection
84. Elaborate the purpose of program inspection? Analyze the different inspection checks/ fault classes done during program inspection.
85. Explain software review and inspection of quality assurance
86. List and explain the factors affecting the software pricing.

Module 4: Agile Software Development

87. What are the characteristics of Rapid Application Development

88. List and explain the principles of agile method
89. Differentiate between plan driven and agile development
90. With a figure explain The extreme programming release cycle
91. List out the Extreme programming practices
92. Explain how texting is carried out in extreme programming
93. What is pair programming? Explain
94. With a figure explain the Scrum process
95. Differentiate between Large software system development and small system development
96. List out the reasons as why it is difficult to introduce agile methods in larger companies
97. Explain why the rapid delivery and deployment of new systems is often more important to businesses than the detailed functionality of these systems.
98. Extreme programming expresses user requirements as stories, with each story written on a card. Discuss the advantages and disadvantages of this approach to requirements description.

Module 5: Managing Project Finance

99. Explain cost estimating and work breakdown structure with an example
100. Explain cost aggregation, reserve analysis, parametric estimating with suitable example.
101. Explain change control and resource management using suitable example.
102. Calculate the cost variance ,earned value ,schedule variance with and example.
103. Explain cost performance index with an example.
104. List out the 10 features of tool to manage project finance touch base project financials.