

NGM COLLEGE

DEPARTMENT OF COMPUTER SCIENCE (SF)

17UCS414 – SOFTWARE ENGINEERING

Unit:1

1) From the following which quality deals with maintaining the quality of the software product?

- a. Quality assurance
- b. Quality control**
- c. Quality efficiency
- d. None of the above

2. State if the followings are true or false.

For scheduling a project, it is necessary to:

- 1) Break down the project tasks into smaller, manageable form.
- 2) Find out various tasks and correlate them.
- 3) Estimate time frame required for each task.
- 4) Divide time into work-units.

- a. True**
- b. False

3. Software is not considered to be collection of executable programming code, associated libraries and documentations.

- a. True
- b. False**

4. Which of these primary objectives have to be achieved for the requirement model?

- a. To describe what the customer requires
- b. To establish a basis for the creation of a software design
- c. To define a set of requirements that can be validated once the software
- d. All mentioned above**

5. CASE tools cannot be grouped together if they have similar functionality, process activities and capability of getting integrated with other tools.

- a. True
- b. False**

6. Which depicts flow of control in program modules?

- a. **Flowchart**
- b. DFD
- c. Both A & B
- d. None of the above

7. Abbreviate the term HIPO.

- a. **Hierarchical Input Process Output**
- b. High-level Input Process Output
- c. Huge Input Process Output
- d. None of the above

8. The total number of distinct operator and operand occurrences measures are used in _____ .

- a. Lawrence theory
- b. **Halstead's theory**
- c. Kyburg, H. E.
- d. Jech, T.

9. Which model gives the overall reliability of the system that is projected and certified?

- a. Sampling model
- b. Component model
- c. **Certification model**
- d. Both A & B

10. Which aspect is important when the software is moved from one platform to another?

- a. Maintenance
- b. Operational
- c. **Transitional**
- d. All of the above

Unit:2

11. A software project manager is a person who undertakes the responsibility of carrying out the software project.

- a. **True**
- b. False

12. From the following methods which size of the software product can be calculated?

- a. Counting the lines of delivered code
- b. Counting delivered function points
- c. Both A and B**
- d. None of the above

13. Abbreviate the term PERT.

- a. Program Evolution & Review Technique**
- b. Process Evolution & Review Tool
- c. Project Evaluation & Request Technique
- d. None of the above

14. Which is the characteristics of Software risk?

- a. Uncertainty
- b. Loss
- c. Both A & B**
- d. None of the above

15. Object Constraint Language (OCL) is a formal notation developed, so that users of UML can add more precision to their specifications.

- a. True**
- b. False

16. Which one of the following is not an Evolutionary Process Model?

- a) WINWIN Spiral Model
- b) Incremental Model
- c) Concurrent Development Model
- d) All of the mentioned**

17. What is the major advantage of using Incremental Model?

- a) Customer can respond to each increment
- b) Easier to test and debug
- c) It is used when there is a need to get a product to the market early
- d) Easier to test and debug & It is used when there is a need to get a product to the market early**

18. The spiral model was originally proposed by

- a) IBM
- b) Barry Boehm**
- c) Pressman
- d) Royce

19. The spiral model has two dimensions namely _____ and _____

- a) diagonal, angular
- b) radial, perpendicular

- c) **radial, angular**
- d) diagonal, perpendicular

20. Identify the disadvantage of Spiral Model.

- a) **Doesn't work well for smaller projects**
- b) High amount of risk analysis
- c) Strong approval and documentation control
- d) Additional Functionality can be added at a later date

Unit:3

21. Spiral Model has user involvement in all its phases.

- a) True
- b) **False**

22. If you were to create client/server applications, which model would you go for?

- a) WINWIN Spiral Model
- b) Spiral Model
- c) **Concurrent Model**
- d) Incremental Model

23. RAD stands for

- a) Relative Application Development
- b) **Rapid Application Development**
- c) Rapid Application Document
- d) None of the mentioned

24. Which one of the following is not a software process quality?

- a) Productivity
- b) **Portability**
- c) Timeliness
- d) Visibility

25. _____ & _____ are two kinds of software products.

- a) CAD, CAM
- b) Firmware, Embedded
- c) **Generic, Customised**
- d) None of the mentioned

26. Software costs more to maintain than it does to develop.

- a) **True**
- b) False

27. Which one of the following is not an application of embedded software product?

- a) keypad control of a security system
- b) **pattern recognition game playing**
- c) digital function of dashboard display in a car
- d) none of the mentioned

28. Purpose of process is to deliver software

- a) in time

- b) with acceptable quality
- c) that is cost efficient
- d) **both in time & with acceptable quality**

29. Which of the following activities of a Generic Process framework provides a feedback report?

- a) Communication
- b) Planning
- c) Modeling & Construction
- d) **Deployment**

30. Process adopted for one project is same as the process adopted from another project.

- a) True
- b) **False**

Unit:4

31. Which one of the following is not an Umbrella Activity that complements the five process framework activities and help team manage and control progress, quality, change, and risk.

- a) Reusability management
- b) Risk management
- c) Measurement
- d) **User Reviews**

32. Four types of change are encountered during the support phase. Which one of the following is not one that falls into such category?

- a) **Translation**
- b) Correction
- c) Adaptation
- d) Prevention

33. If a software production gets behind schedule, one can add more programmers and catch up.

- a) True
- b) **False**

34. choose an internal software quality from given below:

- a) scalability
- b) usability
- c) **reusability**
- d) reliability

35. RUP stands for _____ created by a division of _____

- a) Rational Unified Program, IBM
- b) Rational Unified Process, Infosys
- c) Rational Unified Process, Microsoft
- d) **Rational Unified Process, IBM**

36. Which one of the following is not a fundamental activity for software processes in software engineering ?

- a) **Software Verification**

- b) Software Validation
- c) Software design and implementation
- d) Software evolution

37. What are the types of requirements ?

- a) Availability
- b) Reliability
- c) Usability
- d) **All of the mentioned**

38. Select the developer-specific requirement ?

- a) Portability
- b) Maintainability
- c) Availability
- d) **Both Portability and Maintainability**

39. Select the developer-specific requirement ?

- a) Portability
- b) **Maintainability**
- c) Availability
- d) Both Portability and Maintainability

40. FAST stands for

- a) Functional Application Specification Technique
- b) Fast Application Specification Technique
- c) **Facilitated Application Specification Technique**
- d) None of the mentioned

Unit:5

41. QFD stands for

- a) quality function design
- b) quality function development
- c) **quality function deployment**
- d) none of the mentioned

42. The user system requirements are the parts of which document ?

- a) SDD
- b) **SRS**
- c) DDD
- d) SRD

43. Conflicting requirements are common in Requirement Engineering, with each client proposing his or her version is the right one.

- a) **True**
- b) False

44. Which is one of the most important stakeholder from the following ?

- a) Entry level personnel
- b) Middle level stakeholder

- c) Managers
- d) **Users of the software**

45. Which one of the following is a functional requirement ?

- a) Maintainability
- b) Portability
- c) Robustness
- d) **None of the mentioned**

46. Which one of the following is a requirement that fits in a developer's module ?

- a) Availability
- b) Testability
- c) Usability
- d) Flexibility

47. "Consider a system where, a heat sensor detects an intrusion and alerts the security company." What kind of a requirement the system is providing ?

- a) **Functional**
- b) Non-Functional
- c) Known Requirement
- d) None of the mentioned

48. Functional requirements capture the intended behavior of the system.

- a) **True**
- b) False

49. Choose the incorrect statement with respect to Non-Functional Requirement(NFR).

- a) Product-oriented Approach – Focus on system (or software) quality
- b) Process-oriented Approach – Focus on how NFRs can be used in the design process
- c) **Quantitative Approach – Find measurable scales for the functionality attributes**
- d) Qualitative Approach – Study various relationships between quality goals

50. How many classification schemes have been developed for NFRs ?

- a) Two
- b) Three
- c) Four
- d) **Five**

UNIT:1

- Define Processes that serve needs of view
- Represent behavior of process and assumption
- Explicitly define Exogenous and Endogenous Input
- Represent all Linkages that enable engineer to better understand view.

5 **Define Framework.**

Ans. Framework is the Code Skeleton that can be fleshed out with specific classes or functionality and Designed to address specific problem at hand.

6 **What are the important roles of Conventional Component within the Software Architecture?**

Ans. The important roles of Conventional component within the Software Architecture are:

- **Control Component:** That coordinates invocation of all other problem domain.
- **Problem Domain Component:** That implements Complete or Partial function required by customer.
- **Infrastructure Component:** That responsible for functions that support processing required in problem domain.

7 **Differentiate Software Engineering methods, tools and procedures.**

Ans. Methods: Broad array of tasks like project planning cost estimation etc.

Tools: Automated or semi automated support for methods.

Procedures: Holds the methods and tools together. It enables the timely development of computer software.

8 Who is called as the Stakeholder?

Ans. Stakeholder is anyone in the organization who has a direct business interest in the system or product to be built.

9 Write about Real Time Systems.

Ans. It provides specified amount of computation with in fixed time intervals. RTS sense and control external devices, respond to external events and share processing time between tasks.

10 Define Distributed system.

Ans. It consists of a collection of nearly autonomous processors that communicate to achieve a coherent computing system.

11 What are the characteristics of the software?

Ans. Characteristics of the software are:

- Software is engineered, not manufactured.
- Software does not wear out.
- Most software is custom built rather than being assembled from components.

12 What are the various categories of software?

Ans. The various categories of software are:

- System software Application.
- Software Engineering / Scientific.

- Software Embedded software.
- Web Applications.
- Artificial Intelligence software.

UNIT:2

13 What are the challenges in software?

Ans. The challenges in software are:

- Copying with legacy systems.
- Heterogeneity challenge.
- Delivery times challenge.

14 Define Software process.

Ans. Software process is defined as the structured set of activities that are required to develop the software system.

15 What are the fundamental activities of a software process?

Ans. The fundamental activities of a software process are:

- Specification
- Design and Implementation
- Validation
- Evolution

16 What are the umbrella activities of a software process?

Ans. The umbrella activities of a software process are:

- Software project tracking and control.
- Risk Management.
- Software Quality Assurance.
- Formal Technical Reviews.
- Software Configuration Management.
- Work product preparation and production.
- Reusability management, Measurement.

17 List the activities during project Initiation.

Ans. Important activities during project initiation phase:

- Management team building.
- Enables the team members to understand one another.
- Minimize the impact of cultural and language barriers.
- Scope and high level work division agreements.
- Management reporting and escalating procedures.
- Involvement of infra structure / support groups.
- Team formation.
- Project kick off meeting is attended by formally all concerned so that everyone has a common understanding of what is expected.

18 What is work breakdown structure?

Ans. Work breakdown structure is the decomposition of the project into smaller and more manageable parts with each part satisfying the following criteria-

- Each WBS unit has a clear outcome.
- The outcome has a direct relationship to achieve the overall project goal.
- Each point has single point of accountability.

19 What are the issues that get discussed during project closure?

Ans. The issues that get discussed during project closure are:

- What were the goals that we set out to achieve?
- How effective were the in process metrics?
- What were the root causes for under-achievement or over achievement?
- Was our estimation effort correct?
- What were the factors in the environment that would like to change?
- What did we gain from the system or environment?
- Was our estimation of the hardware correct?

20 Give any two activities of project initiation.

Ans. Management team building and Team formation.

21. What are the external dependencies in project planning?

Ans. Staffing, Training, Acquisition and Commissioning of new hardware, Availability of modules, Travel.

22. What are internal milestones?

Ans. They are the measurable and quantifiable attributes of progress. They are the intermediate points in the project which ensure that we are in the right track. They are under the control of project manager.

23. What is the role of the project board?

Ans. The overall responsibility for ensuring satisfaction progress on a project is the role of the project board.

24. What is the role of project manager?

Ans. The project manager is responsible for day to day administration of the project.

25. What is closed system?

Ans. Closed systems are those that do not interact with the environment.

UNIT:3

26. What is embedded system?

Ans. A system that is a part of a large system whose primary purpose is non computational.

27. What is a Process Framework?

Ans. Process Framework establishes foundation for a complete software process by identifying a small number of framework activities that are applicable for all software projects regardless of their size and complexity.

28. What are the Generic Framework Activities?

Ans. Generic Framework Activities are:

- Communication.
- Planning.
- Modeling.
- Construction.
- Deployment.

29. Define Stakeholder.

Ans. Stakeholder is anyone who has stake in successful outcome of project such as:

- Business Managers,
- End-users,
- Software Engineer,
- Support People

30. How the Process Model differ from one another?

Ans. Process Model differ from one another due to the following reasons:

- Based on flow of Activities.
- Interdependencies between Activities.
- Manner of Quality Assurance.
- Manner of Project Tracking.
- Team Organization and Roles.
- Work Products identify a requirement Identifier.

31 Write out the reasons for the Failure of Water Fall Model?

Ans. Reasons for the Failure of Water Fall Model are :

- Real project rarely follow sequential Flow. Iterations are made in indirect manner.
- Difficult for customer to state all requirements explicitly.
- Customer needs more patients as working products reach only at deployment phase.

32 What are the Drawbacks of RAD Model ?

Ans. Drawbacks of RAD Model are :

- Require sufficient number of Human Resources to create enough number of teams.
- Developers and Customers are not committed, system result in failure.
- Not Properly Modularized building component may Problematic.
- Not applicable when there is more possibility for Technical Risk.

33 Define the term Scripts.

Ans. Scripts Specific Process Activities and other detailed work functions that are part of team process.

34. Write the disadvantages of classic life cycle model.

Ans. Disadvantages of classic life cycle model are :

- I. Real projects rarely follow sequential flow. Iteration always occurs and creates problem.

- II. Difficult for the customer to state all requirements.
- III. Working version of the program is not available. So the customer must have patience.

35. What do you mean by task set in spiral Model?

Ans. Each of the regions in the spiral model is populated by a set of work tasks called a task set that are adopted to the characteristics of the project to be undertaken.

36. What is the main objective of Win-Win Spiral Model ?

Ans. The customer and the developer enter into the process of negotiation where the customer may be asked to balance functionality, performance and other product against cost and time to market.

37. Which of the software engineering paradigms would be most effective? Why?

Ans. Incremental / Spiral model will be most effective.

Reasons :

- I. It combines linear sequential model with iterative nature of prototyping.
- II. Focuses on delivery of product at each increment.
- III. Can be planned to manage technical risks.

38. What are the merits of incremental model ?

Ans. The merits of incremental model are :

- I. The incremental model can be adopted when there are less number of people involved in the project.
- II. Technical risks can be managed with each increment.
- III. For a very small time span, at least core product can be delivered to the customer.

39. List the task regions in the Spiral model.

Ans. Task regions in the Spiral model are :

- **Customer Communication** : In this region it is suggested to establish customer communication.
- **Planning** : All planning activities are carried out in order to define resources timeline and other project related activities.
- **Risk Analysis** : The tasks required to calculate technical and management risks.
- **Engineering** : In this the task region, tasks required to build one or more representations of applications are carried out.
- **Construct and Release** : All the necessary tasks required to construct, test, install the applications are conducted.
- **Customer Evaluation** : Customer's feedback is obtained and based on the customer evaluation required tasks are performed and implemented at installation stage.

40. What are the drawbacks of spiral model ?

Ans. The drawbacks of spiral model are :

1. It is based on customer communication. If the communication is not proper then the software product that gets developed will not be the up to the mark.
2. It demands considerable risk assessment. If the risk assessment is done properly then only the successful product can be obtained.

UNIT:4

41 Name the Evolutionary process Models.

Ans. Evolutionary powers models are :

- I. Incremental model
- II. Spiral model
- III. WIN-WIN spiral model
- IV. Concurrent Development

42 Define Software Prototyping.

Ans. Software prototyping is defined as a rapid software development for validating the requirements.

43 What are the benefits of prototyping ?

Ans. The benefits of prototyping are :

- I. Prototype services as a basis for deriving system specification.
- II. Design quality can be improved.

- III. System can be maintained easily.
- IV. Development efforts may get reduced.
- V. System usability can be improved.

44. What are the prototyping approaches in software process?

Ans. The prototyping approaches in software process are :

- I. **Evolutionary prototyping** : In this approach of system development, the initial prototype is prepared and it is then refined through number of stages to final stage.
- II. **Throw-away prototyping** : Using this approach a rough practical implementation of the system is produced. The requirement problems can be identified from this implementation. It is then discarded. System is then developed using some different engineering paradigm.

45. What are the advantages of evolutionary prototyping ?

Ans. The advantages of evolutionary prototyping are :

- I. Fast delivery of the working system.
- II. User is involved while developing the system.
- III. More useful system can be delivered.
- IV. Specification, design and implementation work in co-ordinated manner.

46. What are the various Rapid prototyping techniques ?

Ans. The various rapid prototyping techniques are :

- I. Dynamic high level language development.
- II. Database programming.
- III. Component and application assembly.

47. What is the use of User Interface prototyping ?

Ans. This prototyping is used to pre-specify the look and feel of user interface in an effective way.

48. Give the phases of product development life cycle.

Ans. The phase of product development life cycle are :

- **Idea generation** : Ideas come from various sources like customers, suppliers, employees, market place demands.
- **Prototype development phase** : This entails building a simplistic model of final product.
- **Beta phase** : This iron out the kinks in the product and add necessary supporting infrastructure to roll out the product.
- **Production phase** : In this phase product is ready for prime time.
- **Maintenance and obsolescence phase** : In this critical bugs are fixed after which the product goes into obsolescence.

49. Explain water fall model in detail.

Ans. The project is divided into sequence of well defined phases. One phase is completed before next starts. There is a feedback loop between adjacent phases. What the actual phase are depends on the project.

Advantages :

- Simplicity
- Lining up resources with appropriate skills is easy

Disadvantages :

- Highly impractical for most projects
- Phases are tightly coupled.

50 Explain RAD model in detail

Ans. The customer and developer agree on breaking the product into small units. Development is carried out using modeling tools and CASE tools. Customer is kept in touch so the changes are reflected time. Quality assurance is imposed.

Advantages :

- Responsiveness to change
- Ability to capture user requirements effectively.
- Application turn around time is shorter.

Disadvantages :

- Need for modeling tools which adds expense.
- Places restriction on type and structure.

51. What is the principle of prototype model ?

Ans. A prototype is built to quickly demonstrate to the customer what the product would look like. Only minimal functionality of the actual product is provided during the prototyping phase.

52. What is the advantage of Spiral model ?

Ans. The main advantages of spiral model is, it is realistic and typifies most software development products/projects. It combines the best features of most of the earlier models. It strikes a good balance mechanism for early problem identification and correction while not missing out proactive problem prevention.

UNIT:5

53 What is lifecycle model ?

Ans. Here different terms have specialization and responsibility in different life cycle phase.

54. Why Formal Methods are not widely used?

Ans. Formal Methods are not widely used due to the following reasons :

- It is Quite Time Consuming and Expensive.
- Extensive expertise is needed for developers to apply formal methods.
- Difficult to use as their technically sophisticated maintenance may become risk.

55. What are the Objectives of Requirement Analysis ?

Ans. Objectives of Requirement Analysis are :

- It describes what customer requires.
- It establishes a basis for creation of software design.
- It defines a set of requirements that can be validated once the software design is built.

56. Define System Context Diagram (SCD)?

Ans. System Context Diagram (SCD):

- Establish information boundary between System being implemented and Environment in which system operates.
- Defines all external producers, external consumers and entities that communicate through user interface.

57. Define System Flow Diagram (SFD)?

Ans. System Flow Diagram (SFD):

- Indicates Information flow across System Context Diagram region.
- Used to guide system engineer in developing system.

58. What are the Requirements Engineering Process Functions?

Ans. Requirements Engineering Process Functions are:

- | | |
|-----------------|---------------|
| • Inception | • Elicitation |
| • Elaboration | • Negotiation |
| • Specification | • Validation |
| • Management | |

59. What are the Difficulties in Elicitations?

Ans. Difficulties in Elicitation are:

- Problem of Scope
- Problem of Understanding
- Problem of Volatility

60. Define Quality Function Deployment (QFD)?

Ans. Quality Function Deployment (QFD) is a technique that translates needs of customer into technical requirement. It concentrates on maximizing customer satisfaction from the software engineering process.

61. Write a short note on structure charts.

Ans. These are used in architectural design to document hierarchical structure, parameters and interconnections in a system. No Decision box. The chart can be augmented with module by module specification of $\frac{I}{P}$ and $\frac{o}{p}$ attributes.

62. What are the contents of HIPO diagrams?

Ans. The contents of HIPO diagrams are:

Visual table of contents,

Set overview diagrams,

Set of details diagrams.

63 Explain software Requirement Specification.

Ans. Software Requirement Specification includes;

- Information Description
- Functional Description

- Behavioural Description
- Bibliography and Appendix
- Validation criteria
- Preliminary user's Manual

64 What is Requirement Engineering ?

Ans. Requirement engineering is the process of establishing to services that the customer required from the system and constraints under which it operates and is developed.

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17UCS414 – SOFTWARE ENGINEERING

UNIT:1

1. Define Software Engineering.
2. List out the elements in Computer-Based System?
3. What are the factors to be considered in the System Model Construction?
4. What does a System Engineering Model accomplish?
5. Define Framework.
6. What are the important roles of Conventional Component within the Software Architecture?
7. Differentiate Software Engineering methods, tools and procedures.
8. Who is called as the Stakeholder?
9. Write about Real Time Systems.
- 10 Define Distributed systems.

UNIT:2

11. What are the characteristics of the software?
- 12 What are the various categories of software?
- 13 What are the challenges in software?
- 14 Define Software process.
- 15 What are the fundamental activities of a software process?
- 16 What are the umbrella activities of a software process?

- 17 What are the umbrella activities of a software process?
- 18 List the activities during project Initiation.
- 19 What is work breakdown structure?
- 20 What are the issues that get discussed during project closure?

UNIT:3

- 21 Give any two activities of project initiation
- 22. What are the external dependencies in project planning?
- 23. What are internal milestones?
- 24. What is the role of the project board?
- 25. What is the role of project manager?
- 26. What is closed system?
- 27. What are the basic design principles of Class-Based Components?
- 28. List the process activities of software configuration management.
- 29. What are the different types of CASE tools available In Software Engineering?
- 30. Write about the types of project plan

UNIT:4

- 31. What are the objectives of Formal Technical Reviews.
- 32. What are the reasons behind to perform white box testing?.
- 33. What are the testing principles the software engineer must apply while performing the software testing?
- 34. What are the steps followed in testing?
- 35. What are the Basic Principles of Software Testing?
- 36. Give the procedure of the Delphi method.
- 37. Explain the Capability Maturity Model.

- 38. Explain the different phases involved in waterfall life cycle
- 39. What is feasibility study? What are the contents we should contain in the feasibility report?
- 40. What is cardinality? Give examples

UNIT:5

- 41. What is generalization? Give an example of generalization
- 42. Write out the reasons for the Failure of Water Fall Model.
- 43. What are the characteristics of the software?
- 44. Define the terms: i. Agility ii. Agile Team
- 45. What are the challenges in software?
- 46. What are the fundamental activities of a software process?
- 47. What is the difference between the “Known Risks” and Predictable Risks”?
- 48. What are the various types of traceability in software engineering?
- 49. What is ERD?What is DFD?
- 50. What is a state transition diagram?

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UNIT:1

1. Draw a diagram for pure waterfall life cycle.
2. Explain the different phases involved in waterfall life cycle.
3. What are the purposes of Data Flow diagrams, Entity-Relationship diagrams? Give an example diagram of each.
4. What is data modeling? Give 5 examples for data modeling.
5. What is the difference between SRS document and design document? What are the contents we should contain in the SRS document and design document.

UNIT:2

6. Explain all the phases involved in the implementation phase.
7. List and explain different types of testing done during the testing phase.
8. Explain in detail about the software process.
9. Explain in detail about the life cycle process.
10. What is embedded system?

UNIT:3

11. What is a Process Framework?
12. What are the Generic Framework Activities?
13. Define Stakeholder.
14. How the Process Model differ from one another?
15. Explain in detail about Structural Modeling.

UNIT:4

16. Explain in detail about data modeling.
17. Explain about rapid prototyping techniques
18. Explain the prototyping approaches in software process
19. List the task regions in the Spiral model.
20. Characteristics of software contrast to characteristics of hardware?

UNIT:5

21. State the advantages and disadvantages in LOC based cost estimation?
22. Distinguish between the term inception, elicitation, & elaboration with reference to requirements?
23. What is requirements elicitation? Explain various activities performed in it with watch system that facilitates to set time and alarm as an example?
24. What are the various types of system testing?
25. Distinguish between verification and validation