100 Multiple Choice Questions Software Engineering

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December 4, 2025

Section 1: Conceptual Foundations (Questions 1-25)

1. Which of the following is NOT a challenge of learning software engineering?

A) Complexity of software systems

B) Abstract nature of software

C) Static technology landscape

D) Team dependency

2. What is a key success factor in software development?

A) Changing requirements frequently

B) Clear and frozen requirements

C) Minimal user involvement

D) Immature technology adoption

3. Which factor commonly leads to software development failure?

A) Strong stakeholder involvement

B) Realistic schedules

C) Scope creep

D) Proper planning

4. In traditional Waterfall methodology, when does testing occur?

A) Throughout development

B) At the beginning

C) At the end

D) During requirements phase

5. Which characteristic describes Modern Agile development?

A) Linear phases

B) Rigid requirements

C) Iterative development

D) Documentation-driven

6. What does "Shift-Left Testing" mean?

A) Testing only at the end

B) Testing early and often

C) Moving testers to different teams

D) Postponing testing

7. Which is an attribute of high-quality software?

A) High resource consumption

B) Difficult to modify

C) Maintainability

D) Platform-specific only

8. Software validity refers to:

A) Building the product right

B) Building the right product

C) Testing without failures

D) Code efficiency

9. Software reliability is identified through:

A) User acceptance testing only

B) Stress testing and MTBF tracking

C) Requirements reviews

D) Design documents

10. Which is a key characteristic of a professional software engineer?

A) Working in isolation

B) Resisting new technologies

C) Lifelong learning

D) Avoiding communication

11. What is technical debt?

A) Money owed to developers

B) Cost of choosing easy solutions over better approaches

C) Budget overruns

D) Hardware expenses

12. Which testing type is manual testing good for?

A) Load testing

B) Regression testing

C) UI/UX and exploratory testing

D) Automated scripts

13. What is a functional requirement?

A) System performance specification

B) What the system does

C) How fast the system runs

D) Security standards

14. A non-functional requirement example is:

A) User can reset password

B) System has a login button

C) Password reset email sent within 5 seconds

D) Database stores user data

15. Which method measures software size?

A) Lines of Code (LOC)

B) Number of developers

C) Project budget

D) Meeting frequency

16. Function Points estimate based on:

A) Only lines of code

B) Inputs, outputs, inquiries, files, and interfaces

C) Team size alone

D) Project duration

17. Verification asks:

A) Are we building the right product?

B) Are we building the product right?

C) Is the product profitable?

D) Is the product innovative?

18. Validation asks:

A) Are we building the product right?

B) Are we following standards?

C) Are we building the right product?

D) Are we on budget?

19. Which is a non-functional testing type?

A) Unit testing

B) Integration testing

C) Load/Performance testing

D) Acceptance testing

20. What is scope creep?

A) Fixed requirements

B) Unrealistic or changing requirements

C) Clear project boundaries

D) Proper planning

21. Automated testing is best for:

A) One-time exploratory tests

B) Ad-hoc UI testing

C) Regression and load testing

D) Initial user experience evaluation

22. What is a code smell?

A) Well-written code

B) Indicator of potential problems in code

C) Code comments

D) Version control

23. A "Long Method" code smell means:

A) A function doing too many things

B) A well-optimized function

C) A short, concise function

D) Properly documented code

24. Input validation helps prevent:

A) Code optimization

B) SQL Injection and XSS attacks

C) User engagement

D) Database design

25. Static analysis tools are used for:

A) Running the application

B) Auto-scanning for vulnerabilities

C) User interface design

D) Database management

Section 2: Development Methodologies (Questions 26-45)

26. Scrum has how many core roles?

A) Two

B) Three

C) Four

D) Five

27. Who is responsible for maximizing product value in Scrum?

A) Scrum Master

B) Developer

C) Product Owner

D) Tester

28. What does the Scrum Master focus on?

A) Writing code

B) Process facilitation

C) Business value

D) Testing

29. A Sprint Backlog contains:

A) All future work

B) Plan for current sprint

C) Completed features

D) Bug reports only

30. The Product Backlog is:

A) Completed work

B) List of all work items

C) Current sprint tasks only

D) Test cases

31. What is an Increment in Scrum?

A) Planning document

B) Finished, potentially shippable work

C) Meeting agenda

D) Bug list

32. Agile welcomes:

A) Fixed requirements

B) No documentation

C) Changing requirements

D) Late testing only

33. Waterfall is characterized by:

A) Iterative cycles

B) Sequential phases

C) Continuous deployment

D) Flexible requirements

34. DevOps unifies:

A) Development and Operations

B) Testing and Design

C) Planning and Documentation

D) Frontend and Backend

35. In DevOps, monitoring data feeds back to:

A) Deployment only

B) Planning phase

C) Testing only

D) Release management

36. Continuous Integration (CI) involves:

A) Manual deployments

B) Automated builds and testing

C) Annual releases

D) No version control

37. Continuous Deployment (CD) means:

A) Manual release approval

B) Automated deployment to production

C) Quarterly releases

D) Testing in isolation

38. The Spiral Model emphasizes:

A) Linear progression

B) Risk analysis

C) No planning

D) Single iteration

39. RAD (Rapid Application Development) focuses on:

A) Long planning phases

B) Quick prototyping and iteration

C) Extensive documentation

D) Waterfall approach

40. Kanban uses:

A) Fixed time sprints

B) Visual workflow boards

C) No work limits

D) Annual planning

41. Throwaway prototyping involves:

A) Building the final system first

B) Creating a mock version then discarding it

C) No user feedback

D) Skipping design phase

42. Scrum ceremonies do NOT include:

A) Sprint Planning

B) Daily Standup

C) Annual Review

D) Sprint Retrospective

43. Agile values working software over:

A) Customer collaboration

B) Comprehensive documentation

C) Responding to change

D) Individual interactions

44. The infinity loop in DevOps represents:

A) Linear process

B) Continuous cycle

C) One-time deployment

D) Documentation phase

45. In modern development, testing is:

A) Done at the end only

B) Integrated throughout lifecycle

C) Optional

D) Done before coding

Section 3: Testing and Quality (Questions 46-65)

46. Manual testing involves:

A) Automated scripts

B) Human testers playing user role

C) No interaction

D) Only code review

47. Selenium is used for:

A) Manual testing

B) Automated web testing

C) Database design

D) Project management

48. User Acceptance Testing (UAT) verifies:

A) Code syntax

B) System meets user needs

C) Database structure

D) Network speed

49. Regression testing ensures:

A) New features work only

B) Fixes didn't break existing functionality

C) Performance improves

D) Documentation is complete

50. Load testing checks:

A) Code quality

B) System behavior under heavy traffic

C) User interface design

D) Database schema

51. Security testing looks for:

A) Performance issues

B) Vulnerabilities

C) User experience problems

D) Design flaws

52. Mean Time Between Failures (MTBF) measures:

A) Code quality

B) System reliability

C) User satisfaction

D) Development speed

53. Defect Removal Efficiency is a:

A) Product metric

B) Process metric

C) Design pattern

D) Programming language

54. Cyclomatic Complexity measures:

A) Team size

B) Code maintainability

C) Project cost

D) User satisfaction

55. Big O notation is used for:

A) Project planning

B) Algorithm efficiency analysis

C) Team management

D) Documentation

56. SonarQube is a tool for:

A) Project management

B) Static code analysis

C) Database design

D) User testing

57. Unit testing verifies:

A) Entire system

B) Individual functions/components

C) User interface only

D) Network connectivity

58. Integration testing checks:

A) Individual components

B) Components working together

C) User acceptance

D) Documentation quality

59. Stress testing determines:

A) Normal operation

B) System breaking point

C) User preferences

D) Code style

60. Penetration testing is related to:

A) Performance

B) Security

C) Usability

D) Documentation

61. Code coverage measures:

A) Lines of documentation

B) Percentage of code tested

C) Team productivity

D) Project timeline

62. A test case should be:

A) Vague and general

B) Specific and repeatable

C) Undocumented

D) Impossible to automate

63. Smoke testing is:

A) Comprehensive testing

B) Basic functionality check

C) Security testing

D) Performance testing

64. Alpha testing is conducted by:

A) End users

B) Internal team

C) Third-party testers

D) Customers

65. Beta testing is conducted by:

A) Developers only

B) Internal QA team

C) External users/customers

D) Management

Section 4: Software Process and Management (Questions 66-85)

66. An SRS document is:

A) Test plan

B) Software Requirements Specification

C) System Release Schedule

D) Source Code Repository

67. Good requirements should be:

A) Ambiguous

B) Unverifiable

C) Unambiguous and verifiable

D) Incomplete

68. A Process Model provides:

A) Final product

B) Blueprint for how work should be done

C) User interface

D) Database schema

69. Change Control Board (CCB) decides:

A) Code syntax

B) If maintenance requests are approved

C) Testing schedules

D) Developer salaries

70. A Maintenance Request (MR) originates from:

A) Developers

B) Customers/Help Desk

C) Management only

D) Automated systems

71. Legacy code refers to:

A) New features

B) Old code written previously

C) Documentation

D) Test cases

72. The DRY principle means:

A) Document Redundant Yearly

B) Don't Repeat Yourself

C) Deploy Regularly Yet

D) Debug Rigorously Yearly

73. A "God Object" is:

A) Well-designed class

B) Large class that knows too much

C) Optimized code

D) Test framework

74. Version control systems like Git help with:

A) Code compilation

B) Collaboration and code history

C) User interface design

D) Database queries

75. CI/CD stands for:

A) Code Integration/Code Deployment

B) Continuous Integration/Continuous Deployment

C) Central Information/Central Data

D) Code Inspection/Code Documentation

76. A Pull Request is used for:

A) Database queries

B) Code review before merging

C) User authentication

D) Error handling

77. Release Cycle Time is a:

A) Product metric

B) Process metric

C) Design pattern

D) Testing method

78. GDPR relates to:

A) Code quality

B) Data privacy compliance

C) Testing frameworks

D) Design patterns

79. ACM/IEEE codes provide:

A) Programming syntax

B) Ethical guidelines for engineers

C) Testing procedures

D) Design templates

80. Portability means software can:

A) Only run on one OS

B) Run on different environments/OS

C) Be easily deleted

D) Have large file size

81. Usability focuses on:

A) Code efficiency

B) Ease of use for users

C) Database design

D) Network speed

82. Efficiency in software means:

A) Using maximum resources

B) Using resources wisely

C) Slow performance

D) Large memory footprint

83. Story Points are used for:

A) Writing documentation

B) Relative sizing in Agile

C) Code compilation

D) Database indexing

84. A realistic schedule is important for:

A) Project failure

B) Project success

C) Scope creep

D) Poor communication

85. Stakeholder involvement leads to:

A) Project delays

B) Increased success rate

C) Unclear requirements

D) Communication problems

Section 5: Technical Concepts (Questions 86-100)

86. A Process is:

A) A thread within a program

B) Independent program with own memory

C) A function call

D) A variable

87. A Thread is:

A) Independent program

B) Lighter execution unit within a process

C) Database connection

D) Network protocol

88. A Race Condition occurs when:

A) Code runs too fast

B) Two threads access shared data simultaneously

C) Network is slow

D) Database is full

89. Deadlock happens when:

A) Code executes successfully

B) Threads wait on each other forever

C) System runs fast

D) Memory is available

90. A Mutex provides:

A) Unlimited access

B) Mutual exclusion lock for resources

C) No synchronization

D) Multiple simultaneous access

91. A Semaphore:

A) Blocks all access

B) Controls access with counter

C) Has no limit

D) Is only for processes

92. SQL Injection is prevented by:

A) Fast queries

B) Input validation and sanitization

C) Large databases

D) Multiple tables

93. XSS (Cross-Site Scripting) is a:

A) Performance issue

B) Security vulnerability

C) Design pattern

D) Testing method

94. Database indexing improves:

A) Security only

B) Query performance

C) Code readability

D) User interface

95. Refactoring means:

A) Adding new features

B) Cleaning up code without changing behavior

C) Removing functionality

D) Rewriting from scratch

96. Technical stakeholders include:

A) End users only

B) Admins and security leads

C) Customers only

D) Marketing team only

97. Productivity is measured in:

A) Meetings per day

B) LOC per person-month

C) Emails sent

D) Documentation pages

98. Labor rate is expressed as:

A) Cost per line of code

B) Cost per person-month

C) Cost per feature

D) Cost per bug

99. Total Effort is calculated by:

A) Team size $\times$ duration

B) Total LOC ÷ productivity

C) Cost ÷ team size

D) Duration × productivity

100. The feedback loop in software process ensures:

A) No changes needed

B) Problems found are fixed before release

C) Documentation is skipped

D) Testing is avoided
