

Software Engineering Mastery

Software Engineering · Practice Test · 18 Questions

1. Which software development model is characterized by sequential phases where progress flows steadily downwards through conception, initiation, analysis, design, construction, testing, production, and maintenance?

- A) Agile
- B) Waterfall
- C) Spiral
- D) Iterative

2. In Big O notation, what is the time complexity of a standard Binary Search algorithm on a sorted array of size n ?

- A) $O(n)$
- B) $O(n \log n)$
- C) $O(\log n)$
- D) $O(n^2)$

3. Which version control system, created by Linus Torvalds in 2005, uses a directed acyclic graph to track changes in source code?

- A) Subversion
- B) Mercurial
- C) CVS
- D) Git

4. What is the primary purpose of a 'Compiler' in the software build process?

- A) To execute code line-by-line
- B) To translate high-level source code into machine code
- C) To debug memory leaks
- D) To manage database connections

5. In Object-Oriented Programming, which principle allows a subclass to provide a specific implementation of a method that is already provided by its superclass?

- A) Encapsulation
- B) Polymorphism
- C) Inheritance
- D) Abstraction

6. Which testing level focuses on verifying the interactions between integrated units or modules of an application?

- A) Unit Testing
- B) Integration Testing
- C) System Testing
- D) Acceptance Testing

7. What is the term for the 'Code Smell' where a single method or class has grown so large that it is difficult to maintain and understand?

- A) Dead Code
- B) God Object
- C) Shotgun Surgery
- D) Feature Envy

8. In the context of database engineering, what does ACID stand for regarding transaction properties?

- A) Atomicity, Consistency, Isolation, Durability
- B) Array, Code, Input, Data
- C) Algorithm, Computation, Integration, Design
- D) Access, Control, Index, Database

9. Which software architectural pattern separates an application into three interconnected components: the data, the user interface, and the logic?

- A) Microservices
- B) Model-View-Controller
- C) Serverless
- D) Monolithic

10. What is the function of a 'Stack' data structure following the LIFO principle?

- A) First In, First Out
- B) Last In, First Out
- C) Random In, Random Out
- D) First In, Last Out

11. Which type of memory management error occurs when a program fails to release memory that is no longer needed?

- A) Buffer Overflow
- B) Stack Overflow
- C) Memory Leak
- D) Segmentation Fault

12. In API design, what does the HTTP status code '404' specifically indicate?

- A) Internal Server Error
- B) Unauthorized Access
- C) Not Found
- D) Bad Request

13. Which mathematical concept is foundational to understanding the efficiency of algorithms in terms of time and space?

- A) Linear Algebra
- B) Set Theory
- C) Asymptotic Analysis
- D) Probability

14. What is the process of hiding internal state and requiring all interaction to be performed through an object's methods called?

- A) Encapsulation
- B) Inheritance
- C) Polymorphism
- D) Abstraction

15. Which term refers to the process of rewriting existing source code without changing its external behavior to improve its structure?

- A) Compiling
- B) Refactoring
- C) Debugging
- D) Deploying

16. In software engineering, what is the 'Technical Debt' metaphor used to describe?

- A) The cost of hardware upgrades
- B) The implied cost of additional rework caused by choosing an easy solution now instead of a better approach
- C) The amount of money spent on software licenses
- D) The time spent writing documentation

17. Which IEEE standard is widely recognized for defining the structure and content of Software Requirements Specifications (SRS)?

- A) IEEE 829
- B) IEEE 830
- C) IEEE 12207
- D) IEEE 754

18. What is the primary benefit of 'Continuous Integration' (CI) in a DevOps pipeline?

- A) Eliminating the need for testing
- B) Automating the merging and testing of code changes frequently
- C) Reducing the need for version control
- D) Replacing human developers with bots