

Software Engineering Interview Question and Answers

1. **Define software engineering?**

According to IEEE, Software engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software.

2. **What are the categories of software?**

System software

Application software

Embedded software

Web Applications

Artificial Intelligence software

Scientific software.

3. **Define testing?**

Testing is a process of executing a program with the intent of finding of an error.

4. **What is white box testing?**

White box testing is a test case design method that uses the control structure of the procedural design to derive test cases. It is otherwise called as **structural testing**.

5. **What is Black box testing?**

Black box testing is a test case design method that focuses on the functional requirements of the software. It is otherwise called as **functional testing**.

6. **What is verification and validation?**

Verification refers to the set of activities that ensure that software correctly implements a specific function.

Validation refers to the set of activities that ensure that the software that has been built is traceable to customer requirements.

7. What is debugging?

Debugging is the process that results in the removal of error. It occurs as a consequence of successful testing.

8. Define cyclomatic complexity?

Cyclomatic complexity is a software metric that provides a quantitative measurer of the logical complexity of a program.

9. What is error tracking?

Error tracking is an activity that provides a means for assessing the status of a current project.

10. What are case tools?

Computer Aided Software Engineering - CASE tools assist software engineering managers and practitioners in every activity associated with the software process. They automate project management activities manage all work products produced throughout the process and assist the engineers in their analysis, design, coding and test work.

11. What is data design?

Data design transforms the information domain model created during analysis into the data structures that will be required to implement the software.

12. Define cohesion and coupling?

Cohesion is a measure of the relative functional strength of a module.

Coupling is a measure of the relative interdependence among modules.

13. What are the different types of cohesion?

There are different types of cohesion are

Coincidental cohesion

Logical cohesion

Temporal cohesion

Procedural cohesion

Communicational cohesion

14. What are the different types of coupling?

There are different types of coupling are

Data coupling

Stamp coupling

Control coupling

External coupling

Common coupling

Content coupling

15. What is user interface design?

User interface design creates an effective communication medium between a human and a computer.

16. What is meant by specification?

A specification can be a written document, a graphical model, a formal mathematical model, a collection of usage scenarios, a prototype or any combination of these.

17. Define process?

A series of steps involving activities, constraints, and resources that produce an intended output of some kind is known as process.

18. How spiral model works?

The spiral model is an evolutionary software process model that couples the iterative nature of prototyping with the controlled and systematic aspects of the waterfall lifecycle model. It also has an emphasis on the use of risk management techniques.

19. What is winwin spiral model?

Winwin spiral model defines a set of negotiation activities at the beginning of each pass around the spiral. The best negotiations strive for a win-win result.

20. Mention the various views in system engineering hierarchy?

The various views in system engineering hierarchy from top to bottom in order are

World view

Domain view

Element view

Detailed view

21. What is software requirements definition?

A software requirements definition is an abstract description of the services which the system should provide and the constraints under which the system must operate.

22. What is SDLC ?

A software cycle deals with various parts and phases from planning to testing and deploying. All these activities are carried out in different ways, as per the needs. Each way is known as a Software Development Lifecycle Model (SDLC).

23. What are data acquisition systems?

Systems that collect data from sensors for subsequent processing and analysis are termed as Data acquisition systems. Data collection process and processing processes may have different periods and deadlines.

24. Define software configuration model?

SCM is the art of identifying, organizing, and controlling modifications to the software being built by a programming team. It is an umbrella activity that is applied throughout the software process.

25. What are the SCM activities?

SCM activities are developed to

Identify change

Control change

Ensure that change is being properly implemented

Report changes to others who may have an interest.

26. What are the advantages and disadvantages of white box testing?

Advantages :

Software's structure logic can be tested.

Disadvantages :

Doesn't ensure that user requirements are met.

Its test may not mimic real world situations.

27. What is meant by loop testing?

Loop testing is a white box testing techniques that focuses exclusively on the validity of loop constructs. This technique can be applied to simple loops, nested loops, concatenated loops and unstructured loops.

28. What is meant by smoke testing?

Smoke testing is an integration testing approach that is commonly used when "shrink wrapped " software products are being developed.

29. What is alpha and beta tests?

Alpha test is the test that is conducted at the developer's site by a customer. Beta test is the test that is conducted at one or more customer sites by the end-user of the software.

30. What is meant by system testing?

System testing is actually a series of different tests whose primary purpose is to fully exercise the computer based system. It verifies whether the system elements have been properly integrated and perform the allocated functions.

31. Mention the categories of debugging approaches?

There are three categories of debugging approaches as follows :

Brute force

Back tracking

Cause elimination

32. Define metric?

IEEE93 defines as a quantitative measure of the degree to which a system, componen, or process possesses a given attribute.

33. Mention some of the process models appropriate for the software to be engineered?

Linear sequential or waterfall model

Prototyping model

Rad model

Incremental model

Spiral model

Winwin spiral model

Component based development model

34. What is adaptive maintenance?

Adaptive maintenance is the maintenance to adapt software to a different operating environment. It involves changing a system so that it operates in a different environment from its initial implementation.

35. What are the advantages and disadvantages of black box testing?

Advantages:

Simulates actual system usage.

makes no system structure assumptions.

Disadvantages :

Potential of missing logical errors in software.

Possibility of redundant testing.

36. What are the broad categories of system requirements?

System requirements may be either functional or non-functional requirements.

37. What are user requirements?

User requirements should describe functional and non-functional requirements so that they are understandable by system users who don't have detailed technical knowledge. User requirements are defined using natural language, tables and diagrams.

38. What is test scenario ?

Test scenario is the hypothetical story to test the particular functionality of an application. It serves as an input to functional testing. For test scenario we need use case.

39. Define an analysis model?

An analysis model is a set of models that serves as the technical representation of

system.

40. Define prototype?

Prototype is an initial version of a software system which is used to demonstrate concepts, try out design options and generally to find out more about the problem and its possible solutions.

41. What is the function of the user model?

The user model establishes the profile of end users of the system.

42. What is system image?

The system image combines the outward manifestation of the computer based system, coupled with all supporting information that describes system syntax and semantics.

43. what is transform mapping?

Transform mapping is a set of design steps that allows a DFD with transform flow characteristics to be mapped into a specific architectural style.

44. What is traceability matrix?

Traceability matrix is a document in which we map the test cases with the requirements. In general we check whether the application works as per requirements or whether we had covered all the required functionality through test cases.

45. List the metrics for specifying non functional requirements?

The possible metrics that specify the non-functional requirements are :

Speed

Size

Easy of use

Reliability

46. What is the difference between black box testing and white box testing?

Black box testing :

No knowledge of the internal logic of the system is used to develop test cases.

Uses validation techniques.

Applied during later stages of testing.

Examples include unit testing, integration testing, system testing, acceptance testing.

White box testing :

Knowledge of the internal logic of the system is used to develop test cases.

Uses verification techniques

Performed early in the testing process.

47. Mention the various types of maintenance?

The various types of maintenance are :

Corrective maintenance

Adaptive maintenance

Perfective maintenance

Preventive maintenance

48. What is the difference between software engineering and system engineering?

Software Engineering - is concerned with all aspects of computer based systems development including hardware, software and process engineering.

System Engineering - are involves in system specification architectural design intergration and deployment.