

Associate Software Engineer Interview Questions And Answers Guide.



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Associate Software Engineer Job Interview Preparation Guide.

Question # 1

What is software engineering?

Answer:-

Some basic definitions of software engineering are:

The application of a disciplined engineering approach to the development of software systems.

A body of knowledge and experience in software development practice and process.

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Question # 2

Can you please explain the difference between computer engineering (CE), computer science (CS), and software engineering (SE)?

Answer:-

While computer engineering programs include courses in software, SE programs incorporate much more detail in software development practice and process, including advanced areas of software architecture, requirements management, quality assurance, and process improvement. Software engineering programs do not stress computer hardware and electronics as much as computer engineering programs do.

On the other hand, software engineering is based on computer science, as other engineering disciplines are based on natural or life sciences. However, software engineering adds an emphasis on issues of process, design, measurement, analysis and verification. In general, scientists seek new knowledge, while engineers want to build things, solve problems, and help people. Both roles are important.

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Question # 3

Why software engineers needed?

Answer:-

Computer systems are pervasive and have a major impact on society. Software is a critical component of all computer systems, including the "embedded systems" used in communication networks, vehicles, consumer electronics and medical devices. Software engineers have the knowledge and skills needed to produce high-quality, effective software on which all these computer systems depend.

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Question # 4

If I like computers. Is Software Engineering for me?

Answer:-

Software Engineering is all about using engineering principles for the production of software. If you like computers, like solving challenging problems and would like to make an impact on the world in which we all live, you should consider software engineering (SE).

Computer systems are an integral part of today's society. Software is a critical component of all computer systems, including the "embedded systems" used in communication networks, vehicles, consumer electronics, and medical devices. Software engineers have the knowledge and skills needed to produce high-quality, effective software on which all these computer systems depend.

BSSE program is one of the first four ABET accredited programs in the United States. Our curriculum provides a strong foundation upon which to build a successful SE career.

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Question # 5

Suppose if I have no previous programming experience. Can I still be successful Software Engineer?

Answer:-

Any previous programming experience that you may have is certainly an asset, but it is not a requirement. It is a very common myth that SE is mainly programming. In fact, SE programs put a lot more emphasis on software development practice and process, including advanced areas of software architecture, requirements management, quality assurance and process improvement.

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Question # 6

During the interview, Why do not obsess over little mistakes that happen?

Answer:-

On more than one occasion, when I gave a star candidate a coding question, he zeroed in on the most optimally performant solution, identified the boundary cases, and began writing well-designed code. Midway through the problem, he makes a little error -- getting the order of operations wrong on the first try, or having an off-by-1 error, or forgetting to declare a variable.

When I point it out, the candidate responds with horror and then becomes so nervous that it impacts his performance during the rest of the interview.

The fear is unfounded. An awesome candidate making a little error is like a concert violinist playing a challenging Brahms concerto and hitting two wrong notes. Sure, the audience could tell that he made mistakes, but they don't get confused as to whether he's actually at Twinkle-Twinkle-Little-Star level.

Even if you completely bomb one question, many interviewers ask you multiple questions and will forgive a single mishap. Even bombing an entire interview is recoverable if the other interviews go well.

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Question # 7

List the types of Architectures in Software Engineering?

Answer:-

An architecture expresses a fundamental structural organization schema for software systems. It provides a set of predefined subsystems, specifies their responsibilities, and includes rules and guidelines for organizing the relationships between them.

- * Object-Oriented/Abstract Data Style
- * Layered Hierarchies
- * Blackboard architecture
- * involving shared access to data with loosely coupled agents
- * Client/Server
- * Three tier Client/Server architectures
- * Peer-to-Peer Architecture

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Question # 8

Which are use cases and class diagrams in Software Engineering?

Answer:-

Use cases are graphical representation of system parts and their interaction that is taking place. Normally we depict the part of the systems who are involved in some activity as actors.

Class Diagrams are a part of designing process. After coming up with use cases of the system, we take each use case and come up with the classes that we need to perform that functionality. Each class will have Class Name, Attributes and Operations associated with it.

Some of the features of the classes are -

- Each class should have well defined responsibilities
- These responsibilities should be cohesive i.e. the system as a whole looks sensible and looks together.

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Question # 9

Describe sequence diagram?

Answer:-

Sequence Diagrams are pictorial representation of event happening according to the time line. In sequence Diagrams, we show respective class names by a small box and the event as an arrow.

Sequence Diagrams help in describing the normal course and alternative course of use cases.

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Question # 10

What are package diagram? What are collaboration diagram?

Answer:-

Collaboration Diagrams:

An alternative presentation of a sequence diagram. We use boxes to describe objects, the lines connecting two boxes indicate that the objects collaborate with one another and we use a multiplicity factor "*" to indicate that all elements of the aggregation receive a message.

Package Diagram:

Complete set of sequence Diagrams or Collaboration Diagrams of the system.

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Question # 11

What are Design patterns?

Answer:-

Design Patterns are simple and elegant solutions of commonly occurring problems in software design. Design Patterns make it easier to reuse successful designs and architectures of experienced and Professional Designers.

There are three types of Patterns -

- 1) Creational - Concerned with creation of objects
- 2) Structural - Concerned with composition of classes or objects
- 3) Behavioral - characterize the ways in which classes and objects interact and distribute responsibility.

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Question # 12



Define SDLC?

Answer:-

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).

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Question # 13

What are the various SDLC models?

Answer:-

Some SDLC models

* The Linear model (Waterfall)

- Separate and distinct phases of specification and development

- All activities in linear fashion

- Next phase starts only when first one is complete

* Evolutionary development

- Specification and development are interleaved (Spiral, incremental, prototype based, Rapid Application development)

- Incremental Model (Waterfall in iteration)

- RAD (Rapid Application Development) - Focus is on developing quality product in less time

- Spiral Model - We start from smaller module and keeps on building it like a spiral. It is also called Component based development.

* Formal systems development

- A mathematical system model is formally transformed to an implementation

* Agile Methods

- Inducing flexibility into development

* Reuse-based development

- The system is assembled from existing components

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Question # 14

Describe the characteristics of good design? Name some Design Tools?

Answer:-

Object Oriented Design Tools - Rational Rose, Rhapsody, Telelogic Tau G2

UI Design Tools - Rapid/Paper prototypes, Simple

SUMI (Software Usability Measurement Inventory) - It will tell you how your product compares to this standardization base: whether you are about average for the market, below, or above.

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Question # 15

What is PSP?

Answer:-

PSP stands for Personal Software Process.

* PSP Objectives are -

- To introduce individuals to a process-based approach to developing software

- To show individuals how to measure, estimate, schedule, and track their work

- To show individuals how to improve the quality of their programs

- In general PSP improves quality and productivity

- The time saved in testing because of better quality reduces time across the project by 20-40%

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Question # 16

What are the advantages of PSP?

Answer:-

Advantage of PSP:

- To manage your work & assess/build your talents/skills

- To plan better

- To track your performance precisely

- To measure the quality of your software products

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Question # 17

What is RUP?

Answer:-

RUP stands for Rational Unified Process

It deals with -

* Iterative software development process.

* Visual Modeling of Systems

* Quality Management

* Change Control Management

* Deals with the role, the activity, and the artifact

* For managing OO Software Development



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Question # 18

List some Features of RUP?

Answer:-

Some Features of RUP are -

- * Online Repository of Process Information and Description
- * Templates for all major artifacts, including:
 - Requirements tracking (RequisitePro templates)
 - Use Cases (Word Templates)
 - Project Management (Project Templates)
- * Process Manuals describing key processes

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Question # 19

What is Testing in Software Engineering?

Answer:-

Testing is running the program(or product) under various circumstances and conditions to find errors and bugs in it. This is important as releasing a faulty product will not only cause serious problems to the end user, it will also harm the companies reputation. There are various kind of Testing conditions and which one to use depends on type of product.

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Question # 20

What are the types of Testing in Software Engineering?

Answer:-

As per Test Target, there is * Unit Testing * Integration Testing * System Testing As per Test Objective, there is * User Acceptance Testing * Installation Testing * Functional * Alpha / Beta testing * Regression * Performance * Stress * Usability * Configuration * Smoke (Sanity Test) Let's see them one by one.

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Question # 21

Described Integration Testing?

Answer:-

According to IEEE, Integration Testing is An orderly progression of testing in which software elements, hardware elements, or both are combined and tested, to evaluate their interactions, until the entire system has been integrated. It Test against system design and Focuses on communication between modules start with one module, then add incrementally. Various Types of Integration Testing are: * big bang approach - Integrate Everything at once * top-down approach - Keep on breaking the system in parts one by one and than test each part. * bottom-up approach - Test the small parts first and than keep on integrating the system and keep on testing the bigger module of it. * mixed approach - Done by help of stubs (Dummy modules)

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Question # 22

Described System Testing?

Answer:-

IEEE Defines it as The process of testing an integrated hardware and software system to verify that the system meets its specified requirements. It is tested against system specification. May test manual procedures, restart and recovery, user interface, stress, performance. In System Testing, real data is used and sometimes users participations is also used.

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Question # 23

Described Unit Testing?

Answer:-

The Tools used in Unit Testing are debuggers, tracers and is Done by Programmers. Unit testing verifies the functioning in isolation of software pieces which are separately testable.

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Question # 24

Described Objective Based Testing?

Answer:-

Some of the testing under this category and what they mean are as follows.

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Question # 25

Described Installation Testing?

Answer:-

System testing conducted once again according to hardware configuration requirements. Installation procedures may also be verified.



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Question # 26

Described Regression Testing?

Answer:-

Regression Testing according to IEEE is "selective retesting of a system or component to verify that modifications have not caused unintended effects". It is repetition of tests intended to show that the software's behavior is unchanged, except insofar as required. It Can be done at each test level.

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Question # 27

Described Stress testing?

Answer:-

We impose abnormal input to stress the capabilities of the software. Input data volume, input data rate, processing time, utilization of memory, etc. are tested beyond the designed capacity.

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Question # 28

Described Functional Testing?

Answer:-

It checks that the functional specifications are correctly implemented. Can also check if Non Functional behavior is as per expectations.

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Question # 29

Described User Acceptance Testing?

Answer:-

Testing conducted to determine whether or not a system satisfies its acceptance criteria and to enable the customer to determine whether or not to accept the system. It is Done against requirements and is done by actual users.

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Question # 30

Described Alpha / Beta testing?

Answer:-

Probably one term which you must be aware of as we often hear this software is in Alpha phase and in Beta phase. Here Testing is done by representative set of potential users for trial use. Please Note - in-house (alpha testing) - external (beta testing).

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Question # 31

Described Performance Testing?

Answer:-

It is verifying that the software meets the specified performance requirements (response time, volume).

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Question # 32

Described Configuration Testing?

Answer:-

It is Used when software meant for different types of users. It also check that whether the software performs for all users.

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Question # 33

Described Usability Testing?

Answer:-

It evaluate the Human Computer Interface. Verifies for ease of use by end-users. Verifies ease of learning the software, including user documentation. Checks how effectively the software functions in supporting user tasks. Checks the ability to recover from user errors.

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Question # 34

How to Design a Test Case?

Answer:-

This Question is often asked in microsoft of from any other company who is looking to hire you for testing work. A test case will have 5 section.

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Question # 35

Described Security Testing?

Answer:-

It is used to verify proper controls have been designed.

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Question # 36

Described Recovery Testing?

Answer:-

It is used in verifying software restart capabilities after a "disaster".

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Question # 37

Described Sanity Test?

Answer:-

It is used to Verify whether the build is ready for feature/requirement based testing).

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Question # 38

Which are main steps involved in developing a software?

Answer:-

The steps involved are Planning Analysis Design coding testing. After testing maintenance of the product is also involved.

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Question # 39

What are the Functional and Non Functional Requirements in Software Engineering?

Answer:-

Functional Requirements are the Expected functionality or services from the system.

Non - Functional Requirements are System property and constraints. Now Constraints can be on requirements itself. Some examples are of Response time, 24X7 availability of the system etc.

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Question # 40

Define SRS?

Answer:-

SRS stands for Software Requirement Specification.

It establishes the basis for agreement between customers and contractors or suppliers on what the software product is expected to do, as well as what it is not expected to do.

Some of the features of SRS are -

- * It sets permits a rigorous assessment of requirements before design can begin.
- * It sets the basis for software design, test, deployment, training etc. It also sets pre-requisite for a good design though it is not enough.
- * It sets basis for software enhancement and maintenance.
- * It sets Basis for Project plans like Scheduling and Estimation.

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Question # 41

Described Requirement Engineering?

Answer:-

Software Requirements are Descriptions and specifications of a system-A requirement is a condition or capability to which the system must conform and Define. A system is designed with certain functionality in mind and to come up with that functionality and its specification right at the beginning is Requirement Engineering. Requirements Engineering-Eliciting, organizing, and documenting the requirements of the system-The process of establishing the services that the customer requires from a system and the constraints under which it operates and is developed Software requirements should be:

- * Clear
- * complete
- * Unambiguous
- * Quantitative

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