

Interview Questions : Unit Testing

Q1	What is the difference between Unit Testing and Integration Testing?
Reference link	https://www.geeksforgeeks.org/difference-between-unit-testing-and-integration-testing/#:~:text=Unit%20Testing%20is%20typically%20performed,two%20software%20units%20or%20modules.
Ans	<p>Unit testing is more often done by the developers to test their units to check their sanity and verify if it works as expected. In the modern methodologies of TDD, it is also a tool that acts as guiding rails for developers to write code.</p> <p>Integration testing is done when multiple units are ready for deployment and hence take its place only at the end of the SDLC. There are dedicated testers to perform integration testing.</p>

Q2	How do you perform Unit Testing?
Ans	To aid with Unit Testing, Java has an automated testing framework called JUnit. We may use this to write test cases for the class or method that we want to test.

Q3	In an organisation, who performs Unit Testing?
Reference Link	https://www.geeksforgeeks.org/unit-testing-software-testing/#:~:text=Unit%20Testing%20is%20typically%20performed,usually%20performed%20by%20the%20developers.https://www.geeksforgeeks.org/unit-testing-software-testing/#:~:text=Unit%20Testing%20is%20typically%20performed,usually%20performed%20by%20the%20developers.
Ans	<p>The responsibility for unit testing depends on the SDLC model that is chosen. If Agile models like XP/SCRUM are followed, there is a requirement to write Tests before development. In such cases, the responsibility of writing test cases falls to the Software developers. If the waterfall model is used, testing would only occur at the end of the development cycle. In such a scenario, both Developers and Quality Assurance team may write the Unit tests. However, such a model is inefficient since testing along with development helps identify bugs at early stages.</p>

Q4	How do you test a private method?
Reference Link	https://anthonysciamanna.com/2016/02/14/should-private-methods-be-tested.html
Ans	<p>First of all, we have to address the reason to test a private method. If the method is private, what significance does it hold outside the class. Is it called inside another method, within the same class? After these questions are answered, .There are frameworks available to test private methods too, but it is not possible with JUnit. However, there are a few tricks to change the code and test it using JUnit:</p> <ol style="list-style-type: none"> 1. Changing the visibility of the method from private to protected temporarily. 2. Call the private method inside another dummy public method (if not already called in another public method)
Q5	Is it necessary to test every method in a class?
Reference link	https://softwareengineering.stackexchange.com/questions/130925/should-we-test-all-our-methods
Ans	It is not necessary to write test methods for every method in a class. There are simple methods: Getters & Setters, which do not require testing. The simple rule to follow is that tests must be written for a method only if the method can break.
Q6	What naming convention do you follow for test methods?
Ans	<p>The name of the test method should indicate the intent and the expected outcome. It should also give a clear idea of what functionality is tested. The format of the test method name is:</p> <p><i><Condition>_<Outcome>()</i></p> <p>Eg. <i>When_factorial_of_6_is_calculated_it_should_return_720()</i></p>
Q7	What is the @Ignore annotation used for?
Reference Link	https://www.guru99.com/junit-ignore-test.html#:~:text=The%20%40Ignore%20test%20annotation%20is,Ignore%20along%20with%20%40Test%20annotation.
Ans	The @Ignore annotation is used when a test method must not be exempted from execution when running a test class.

Q8	What is mocking and how is it useful?
Reference link	https://www.telerik.com/products/mocking/unit-testing.aspx#:~:text=Mocking%20is%20a%20process%20used,or%20state%20of%20external%20dependencies.
Ans	Mocking is the process of creating a fake object of a class. It is possible to override all the methods of this object to make it return any attribute as required. The purpose of mocking is to isolate and focus on the code being tested and not on the behavior or state of external dependencies.

Q9	What is the difference between <i>Mockito.mock()</i> and <i>Mockito.spy()</i>?
Reference Link	https://javapointers.com/java/unit-test/difference-between-spy-and-mock-in-mockito/#:~:text=The%20difference%20is%20that%20in,stubbing%20specific%20methods%20of%20it.&text=While%20in%20spy%20objects%2C%20of,call%20the%20real%20method%20behavior.
Ans	<i>Mockito.mock()</i> is used to create a fake object of a class. <i>Mockito.spy()</i> is used to create a version of an already existing object, where it is possible to override the methods.

Q10	When is mocking used?
Ans	It is preferred to use the concept of mocking whenever there is one method called inside another method. Other instances where mocking finds its use is when it is impractical to replicate the actual scenarios as testing conditions. Eg. whenever Date/Time, random events or Files are involved.

Q11	Explain the process of Test Driven Development
Ans	<p>In the process of Test Driven Development, failing a test case is written first and the task is to write enough code to make the failing test case pass. After the test case passes, more assertions are added to the same test case until the feature is implemented. The process goes like:</p> <ol style="list-style-type: none"> 1. Write a test case for a feature to be implemented 2. Run test case: it fails <ul style="list-style-type: none"> ○ If it passes, go to step 1 ○ If it fails, go to step 3 3. Write enough code to make test case pass <ul style="list-style-type: none"> ○ Go to step 2

Q12	What are the benefits of Test Driven Development
Reference Link	https://www.codica.com/blog/test-driven-development-benefits/
Ans	TDD enables the developers to identify bugs and errors in their code during the stage of development/implementation. In a way, TDD also enforces good coding practices since it forces developers to write smaller methods, just about enough to satisfy the tests. It also allows developers to refactor code without any uncertainties.

Q13	What is meant by test coverage and how is it measured?
Reference Link	https://www.guru99.com/test-coverage-in-software-testing.html
Ans	<p>Test coverage is a quantitative estimate of what % of your code is tested. In many IDEs it is possible to measure coverage at the click of a button. There are 3 types of test coverage that can be measured:</p> <ol style="list-style-type: none"> Coverage by class Coverage by method Coverage by line <p>In TDD, it is preferred that more than 98% of the code written is covered by tests.</p>

Q14	What is the necessity to refactor code?
Reference Link	https://www.altexsoft.com/blog/engineering/code-refactoring-best-practices-when-and-when-not-to-do-it/#:~:text=The%20basic%20purpose%20of%20code,process%20go%20much%20more%20smoothly.
Ans	The basic purpose of code refactoring is to make the code more efficient and maintainable. This is key in reducing technical cost since it's much better to clean up the code now than pay for costly errors later. Code refactoring, which improves readability, makes the QA and debugging process go much more smoothly. And while it doesn't remove bugs, it can certainly help prevent them in the future.

Q15	Should you test methods/classes after refactoring?
Ans	Yes, it is necessary to test the classes and methods after refactoring is done. This is to ensure that the changes made to the code does not affect the functionality in any manner.

Some links where more interview questions can be found:

- <https://www.janbasktraining.com/blog/unit-testing-interview-questions/>
- <https://dzone.com/articles/java-unit-testing-interview>
- <https://www.javatpoint.com/junit-interview-questions>
- https://www.tutorialspoint.com/junit/junit_interview_questions.htm
- <https://beginnersbook.com/2013/10/junit-interview-questions-answers/>
- <https://www.guru99.com/software-testing-interview-questions.html>
- [https://www.wisdomjobs.com/e-university/test-driven-development-tdd-interview-questions.h
tml](https://www.wisdomjobs.com/e-university/test-driven-development-tdd-interview-questions.html)
- <https://www.geeksforgeeks.org/test-driven-development-tdd/>
- <https://www.guru99.com/test-driven-development.html>
- [https://www.exams99.com/interview-questions/test-driven-development-tdd-interview-questi
ons-and-answers](https://www.exams99.com/interview-questions/test-driven-development-tdd-interview-questions-and-answers)