**Unit-4**

**Q.1) What is Integration testing & explain its types with suitable diagram?**

* **Integration Testing :** A typical software project consists of multiple software modules, coded by different programmers. Integration Testing is defined as a type of testing where software modules are integrated logically and tested as a group. Integration testing is the process of testing the interface between two software units or modules.

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| top down.png |

* **Types of Integration testing :**

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| bottom up.png |

1. **Top-Down Integration Testing :** Is a method in which integration testing takes place from top to bottom following the control flow of software system. The higher level modules are tested first and then lower level modules are tested and integrated in order to check the software functionality. Stubs are used for testing if some modules are not ready.
2. **Bottom-Up Integration Testing: Bottom-up Integration Testing** is a strategy in which the lower level modules are tested first. These tested modules are then further used to facilitate the testing of higher level modules. The process continues until all modules at top level are tested. Once the lower level modules are tested and integrated, then the next level of modules are formed.
3. **Smoke Testing:** Testing process that determines whether the deployed software build is stable or not. Smoke testing is a confirmation for QA team to proceed with further software testing. It consists of a minimal set of tests run on each build to test software functionalities. Smoke Testing is done whenever the new functionalities of software are developed and integrated with existing build that is deployed in QA/staging environment. It ensures that all critical functionalities are working correctly or not.
4. **Regression Testing :** Is the process of testing the modified parts of the code and the parts that might get affected due to the modifications to ensure that no new errors have been introduced in the software after the modifications have been made.

**Q.2) Explain with suitable diagram?**

1. **System testing:** System testing is a series of different type of tests with the purpose to exercise and examine the full working of an integrated software computer system against requirements. In other words, a computer system consists of a group of software to perform the various tasks, but only software cannot perform the task; for that software must be interfaced with compatible hardware. To check the end-to-end flow of an application or the software as a user is known as System testing.
2. **Integration testing:** A typical software project consists of multiple software modules, coded by different programmers. Integration Testing is defined as a type of testing where software modules are integrated logically and tested as a group. Integration testing is the process of testing the interface between two software units or modules. Integration test approaches – There are 4 types of integration testing approaches.
3. Top-Down Integration Testing.
4. Bottom-Up Integration Testing.
5. Regression Testing.
6. Smoke Testing
7. **Scenario testing:** Scenario Testing in software testing is a method in which -actual scenarios are used for testing the software application instead of test cases. The purpose of scenario testing is to test end to end scenarios for a specific complex problem of the software. Scenarios help in an easier way to test and evaluate end to end complicated problems. As a tester, you should put yourself in the end user’s shoes and figure out the real-world scenarios and use cases of the Application Under Test.
8. **Use case testing:** Use Case Testing is a software testing technique that helps to identify test cases that cover entire system on a transaction by transaction basis from start to end. Test cases are the interactions between users and software application. Use case testing helps to identify gaps in software application that might not be found by testing individual software components. Use cases are made on the basis of user actions and the response of the software application to those user actions.
9. **System integration testing:** System Integration Testing is defined as a type of software testing carried out in an integrated hardware and software environment to verify the behavior of the complete system. It is testing conducted on a complete, integrated system to evaluate the system’s compliance with its specified requirement. System Integration Testing (SIT) is performed to verify the interactions between the modules of a software system. It deals with the verification of the high and low-level software requirements specified in the Software Requirements Specification/Data and the Software Design Document.
10. **Bidirectional testing:** Bi-directional Integration, is a kind of integration testing process that combines top-down and bottom-up testing. Using stubs, it tests the user interface in isolation as well as tests the very lowest level functions using drivers.

**Q.3) Differentiate Test case & Test Scenario?**

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| **Test case** | **Test Scenario** |
| It's a set of variables or conditions which determine the viability of a software application. | It's a series of test cases executed one after the other to determine the functionality of the system or application. |
| It is a detailed document consisting of application requirements, preconditions, test data, post conditions and expected results. | It is a detailed test procedure consisting of test cases which help find problems in the system and evaluating results. |
| QA team and development team write test cases. | Reviewed by business analyst/ business manager. |
| It is important when development is done onsite and testing is done off- shores. | It is beneficial when time to build test cases is less. |
| More resources are required for writing test cases which is a waste of time and money | It's a collaborative effort which reduces complexity thereby saving time and money. |

**Q.4) Describe Accepting Testing & its types?**

* **Accepting Testing:** Acceptance testing is formal testing based on user requirements and function processing. It determines whether the software is conforming specified requirements and user requirements or not. It is a formal testing according to user needs, requirements and business processes conducted to determine whether a system satisfies the acceptance criteria or not and to enable the users.
* **Types of Accepting testing:**

1. **Business Acceptance Testing (BAT):**BAT is used to determine whether the product meets the business goals and purposes or not. BAT mainly focuses on business profits which are quite challenging due to the changing market conditions and new technologies so the current implementation may have to being changed which results in extra budgets.
2. **Alpha Testing:**Alpha testing is used to determine the product in the development testing environment by a specialized testers team usually called alpha testers.
3. **Beta Testing:**Beta testing is used to assess the product by exposing it to the real end-users, usually called beta testers in their environment. Feedback is collected from the users and the defects are fixed. Also, this helps in enhancing the product to give a rich user experience.

**Q.5) What is System testing & explain its types?**

* **System testing:** System Integration Testing is defined as a type of software testing carried out in an integrated hardware and software environment to verify the behavior of the complete system. It is testing conducted on a complete, integrated system to evaluate the system’s compliance with its specified requirement. System Integration Testing (SIT) is performed to verify the interactions between the modules of a software system. It deals with the verification of the high and low-level software requirements specified in the Software Requirements Specification/Data and the Software Design Document.
* **Types of System Testing:**

1. **Performance Testing:**Performance Testing is a type of software testing that is carried out to test the speed, scalability, stability and reliability of the software product or application.
2. **Load Testing:**Load Testing is a type of software Testing which is carried out to determine the behavior of a system or software product under extreme load.
3. **Stress Testing:**Stress Testing is a type of software testing performed to check the robustness of the system under the varying loads.
4. **Scalability Testing:**Scalability Testing is a type of software testing which is carried out to check the performance of a software application or system in terms of its capability to scale up or scale down the number of user request load.
5. **Recovery Testing:** Is software testing technique which verifies software’s ability to recover from failures like software/hardware crashes, network failures etc. The purpose of Recovery Testing is to determine whether software operations can be continued after disaster or integrity loss. Recovery testing involves reverting back software to the point where integrity was known and reprocessing transactions to the failure point.
6. **Security Testing :** Is a type of Software Testing that uncovers vulnerabilities of the system and determines that the data and resources of the system are protected from possible intruders. It ensures that the software system and application are free from any threats or risks that can cause a loss.

**Q.6) Differentiate is functional & non functional testing?**

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| **Functional** | **Non-functional testing** |
| It is performed before non-functional testing. | It is performed after the functional testing. |
| It is based on customer’s requirements. | It focusses on customer’s expectation. |
| It is easy to define functional requirements. | It is difficult to define the requirements for non-functional testing. |
| Helps to validate the behavior of the application. | Helps to validate the performance of the application. |
| Carried out to validate software actions. | It is done to validate the performance of the software. |
| Functional testing is carried out using the functional specification. | This kind of testing is carried out by performance specifications |
| Functional testing is easy to execute by manual testing. | It’s very hard to perform non-functional testing manually. |
| It describes what the product does. | It describes how the product works. |
| Check login functionality. | The dashboard should load in 2 seconds. |

**Q.7) Explain is defect bash?**

* **A defect bash:** A defect bash is an ad hoc testing ,done by people performing different roles in the same time duration during the integration testing phase .
* To bring out all types of defects that may have been left out by planned testing .
* The testing by all the participants during defect bash is not based on written test cases.
* What is to be tested is left to individual’s decision.
* All the activities in the defect bash are planned activities, except for what to be tested.

**Q.8) Differentiate Stress & load testing?**

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|  | **Load Testing** | **Stress Testing** |
| 1 | Load Testing is performed to test the performance of the system or software application under extreme load. | Stress Testing is performed to test the robustness of the system or software application under extreme load. |
| 2 | In load testing load limit is the threshold of a break. | In stress testing load limit is above the threshold of a break. |
| 3 | In load testing, the performance of the software is tested under multiple number of users. | In stress testing, the performance is tested under varying data amounts. |
| 4 | Huge number of users. | Too much users and too much data. |
| 5 | Load testing is performed to find out the upper limit of the system or application. | Stress testing is performed to find the behavior of the system under pressure. |
| 6 | The factor tested during load testing is *performance*. | The factor tested during stress testing is *robustness* and *stability*. |
| 7 | Load testing determines the operating capacity of a system or application. | Stress testing ensures system security. |
| 8 | The purpose of load testing is to generate more traffic for a web application. | The goal of stress testing is to prevent server crashes under sudden, high loads for an extended period. |
| 9 | Load testing is useful in finding bugs like memory overflows, etc., | Stress testing is useful as it aids the testing unit by testing the system in failure situations |

**Q.9) What is performance testing & explain its type?**

* **Performance Testing :** Performance Testing is a type of software testing that is carried out to test the speed, scalability, stability and reliability of the software product or application. Performance testing is a non-functional software testing technique that determines how the stability, speed, scalability, and responsiveness of an application holds up under a given workload. It’s a key step in ensuring software quality.
* **Type of Performance Testing:**

1. **Load Testing:** Load Testing is to verify that a system/application can handle the expected number of transactions and to verify the system/application behavior under both normal and peak load conditions (no. of users). In  Load Testing   developers understand the behavior of a system under a specific load value.
2. **Stress Testing :** Stress Testing is used to find ways to break the system. The test also provides the range of maximum load the system can hold. Generally, Stress Testing has an incremental approach where the load is increased gradually.
3. **Volume Testing:** Volume Testing is to verify whether a system/application can handle a large amount of data. This testing focuses on Data Base. Performance tester who does volume testing has to populate a huge volume of data in a database and monitors the behavior of a system. Volume testing determines how efficiently software performs with large projected amounts of data. It is also known as flood testing because the test floods the system with data.

**Q.10) What is Functional system testing and Non-Functional system testing?**

* **Functional system testing:** Functional testing is a type of testing which verifies that each function of the software application operates in conformance with the requirement specification. This testing mainly involves black box testing, and it is not concerned about the source code of the application. Every functionality of the system is tested by providing appropriate input, verifying the output and comparing the actual results with the expected results. This testing involves checking of User Interface, APIs, Database, security, client/ server applications and functionality of the Application Under Test. The testing can be done either manually or using automation.
* **Examples** of Functional Testing Types: Unit testing, Smoke testing, User Acceptance, Integration Testing, Regression testing, Localization, Globalization, Interoperability.
* **Non-Functional system testing:** Non-functional testing is a type of testing to check non-functional aspects (performance, usability, reliability, etc.) of a software application. It is explicitly designed to test the readiness of a system as per nonfunctional parameters which are never addressed by functional testing. A good example of non-functional test would be to check how many people can simultaneously login into a software. Non-functional testing is equally important as functional testing and affects client satisfaction.
* **Examples** of Non-functional Testing Types: Performance Testing, Volume Testing, Scalability, Usability Testing, Load Testing, Stress Testing, Compliance Testing, Portability Testing, Disaster Recover Testing.sss