**Software Testing**

**MODULE – 2 (Manual testing)**

**1.What is 7 key principles? Explain in detail?**

* **1.Testing shows the presence of error:** Testing talks about presence of error & does not talk about absence of defects.
* i.e. software testing reduces the probability of defects present in the software but even if no defects are found, that doesn’t mean it is defect free
* Hence testing can reduce presence of defect but cannot remove all defects
* **2.Exhaustive testing is impossible:** It is not possible to test software at every possible test case
* Otherwise it will take more effort, cost & time, which is impractical.
* **3.Early testing:** Testing should start asearly as possible in the software development life cycle, so that if there are any defects in the requirements or design phase, can be found in early stages.
* It is much cheaper to fix a defect in the early stages of testing
* It Saves time &money
* **4.Defect clustering**: Defect clustering states that a small number of modules contain most of the defects
* And if not resolve, then it will cluster at the end
* **5.Pesticide paradox:** Repeating same test cases, again & again will not find new bugs.
* To overcome this, the test cases need to be regularly reviewed & revised or add new test cases
* **6.Testing is context dependent:** Which means that testing an e-commerce website will be different from testing a banking site
* We need to use a different techniques & methods to test different type of software
* **7.Absence of error-fallacy:** it is possible that software which is 99% bug-free is still unusable
* This can happen when software is tested for wrong requirement
* It is not necessary that software should be 99% bug free, but it should also fulfill customer’s requirements

**2.Difference between verification & validation**

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| **Verification** | **Validation** |
| 1.The focus is on, are we building the product as per requirement & design | 1.The focus is on, is the product behaving properly as per customer’s expectation |
| 2.It includes checking documents, design, codes & programs | 2.It includes different testing & validation of the actual product |
| 3.It checks whether the software is as per specification or not | 3.It checks whether the software (final product) meets the requirements & expectations or not |
| 4.It helps to find bugs in the early stage of development | 4.It can only find the bugs that are missed/not found by the verification process |
| 5. Verification is a static testing; it is done before validation | 5. Validation is a dynamic testing; it is done after verification |

**3.What is Error, Defect, Bug & Failure?**

* **Error**: Error is a mistake, misconception or misunderstanding on the part of a software developer**.**
* A mistake in coding called error
* The error present in software, results in change in the functionality of program
* **Defect**: It can be simply defined as a variation between expected and actual results
* Error found by tester called defect
* It can result in the change in behavior or features of software than its requirement
* **Bug:** An error accepted by developer is called bug
* A bug is the result of a coding error
* Coding error can cause program to work poorly, incorrect results & crash
* **Failure:** When a defect reaches the end customer it is called a failure
* It is an inability of software system to perform its required function

**4.Difference between QA v/s QC v/s Testing**

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| **QA** | **QC** | **Testing** |
| 1.It ensures implementation of correct processes, procedures & standards with respect to developed software & requirements | 1**.**it ensures verification of developed software with respect to requirements & specification | 1.It focuses on the identification of bug/defect in software |
| 2.Focuses on processes rather than conducting actual testing | 2.Focuses on actual testing by identifying bug/defect in software by implementing process | 2.Focuses on actual testing |
| 3.Includes process-oriented activities | 3.Includes product-oriented activities | 3. Includes product-oriented activities |
| 4.It is subset of STLC | 4.Subset of quality Assurance | 4.Subset of Quality control |

**5.Explain difference between functional & non-functional testing**

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| **Functional testing** | **Non-functional testing** |
| 1.It verifies the operation & actions of software | 1.It verifies the performance & behavior of software |
| 2.It is based on requirement specification of customer | 2.It is based on performance requirement & expectation of customer |
| 3.It is easy to execute functional testing manually | 3.It is hard to execute it manually, can be done by automation only |
| 4.Unit, integration, smoke/sanity & user acceptance testing are types of functional testing | 4.Load testing, stress testing, performance, security, GUI & compatibility testing are types of non-functional testing |

**6.Difference between smoke & sanity**

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| **Smoke** | **Sanity** |
| 1.It verifies basic & critical functionality of system | 1.It basically emphasis on the objective of rationality of build |
| 2.Once the tester receives the build from developer end, the first test conducted is smoke test | 2.Sanity test is performed after smoke test |
| 3.To check the stability of build or whether the build is acceptable or not | 3.It is performed once the build is stable |
| 4.In this testing we use wide & shallow approach | 4.In this testing we use deep & narrow approach |
| 5.It is also known as “general health check-up”, “build verification” & “dry run” testing | 5.It is basically done on particular component so also known as “specialized health check-up” |
| 6.It is conducted by developers & testers both | 6.It is conducted by testers only |
| 7.While doing smoke we performed only positive test cases | 7.While doing sanity we performed both positive & negative test cases |

**7.What is purpose of exit criteria**

* The purpose of exit criteria is to determine whether testing activity has been completed or not
* It is an important document, part of test plan & decided in planning stage
* This document specifies the requirements that are needed to fulfill before end of software testing process
* Exit criteria helps to decide when to stop testing, like when we run out of time/budget, all defects have been resolved or end of phase of testing

**8.Difference between priority & severity**

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| **Severity** | **Priority** |
| 1.It determines the impact of defect on the application/software | 1.It determines the urgency of defect repairing/how soon defect needs to be fixed by developer |
| 2.Category of severity is decided by tester | 2.Category of priority is set by product manager/customer |
| 3.It deals with the time frame or order to fix defects | 3.It deals with technical aspects of the application |
| 4.Value of severity does not change with time, it is fixed | 4.Value of priority may change after comparison with other defects |

**9.What is bug life cycle**

* It is also known as defect life cycle.
* Bug life cycle refers to the duration or life span between the first-time defect is found & the time it is closed successfully, rejected, postponed or deferred

**10.What is difference between test cases, test scenario & test script**

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| **Test Scenario** | **Test Cases** | **Test Script** |
| 1.it is any functionality that can be tested, having single lines | 1.It is a step by step procedure to test any functionality of software, | 1.Is a set of instruction or a short program to test any functionality of software |
| 2.It is more focused on What to test | 2.It focuses on what to test & how to test | 2.It is focused on expected result |
| 3.It is derived from SRS | 3.It is derived from scenario | 3.It is derived from test cases |
| 4.It requires less time & resources | 4.It requires more time & resources | 4.It requires less time but more resources for creating scripts |
| 5.It is a manual approach of software testing | 5.It is a manual approach of software testing | 5.It is an automatic approach of software testing |
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**11.Explain what test plan is? What is the information that should be discovered?**

* It is a detailed document that describes test strategy, objective, schedule, estimation, entry & exit criteria and resources required to perform testing.
* Test plan help us to determine the effort required to validate the quality of the software
* Test plan is a template which describes what needs to be tested, how it will be tested & who’s responsible for doing so

**12.What is white box testing? List the types of white box testing?**

* White box testing is a method of software testing in which internal structure or working of an application is tested
* In this type of testing testers do have the knowledge of internal structure, implementation of code
* It is basically “structural base” testing
* This type of testing is also known as “Clear box”,” glass box”,” transparent’ testing
* White box testing is performed by developers
* Types of white box testing:
* Unit testing
* Penetration testing
* Testing for memory leak

**13.What is black box testing? What are the different black box testing techniques?**

* It is a method of software testing in which functionality of an application is tested without having knowledge of its internal structure/working or coding
* There are four main Black box testing techniques:
* 1.Equivalent partitioning
* 2.Boundary value analysis
* 3.Decision table
* 4.State transition testing

**14.What is Exploratory testing?**

* Exploratory testing is an unscripted approach to software testing that does not use any specific test script, plan or approach
* It is a testing technique in which the testers explore and identify any functional or technical problems in it & improve quality of software
* This testing is performed by developers

**15.What is traceability matrix?**

* It is a table which is used to trace the requirements during SDLC, also known as RTM (requirement traceability matrix)
* Each requirement in RTM is linked with test case, bug id so that it becomes easy to find root cause of any defect
* It helps to make sure that all the requirements are covered in test cases, so while testing no functionality can be missed

**16.What is boundary value testing?**

* This is one of the software testing technique in which testing of data is based on boundary values or between two opposite ends like from max. to min. or lower to upper
* If input data is taken within the boundary value limits, then it is called positive testing
* If input data is taken outside the boundary value limits, then it is called negative testing

**17.What is Equivalent partitioning testing**

* In this type of software testing technique input data is divided into equal partition of valid & invalid values
* Values from each partition must be tested at least once
* Partition with valid values are user for positive & invalid values are used for negative testing

**18.What is integration testing?**

* The process of testing interface between two or more software units/modules is called integration testing
* There are two types of integration testing 1. Incremental integration 2. Non-incremental

**19.What determines the level of risk?**

* Once the potential risk is identified in testing process next step is to determine level of risk
* High level risk-it is not acceptable, impact of this risk would be very damaging & non-tolerable
* Medium level risk - tolerable but are not desirable.it includes financial loss
* Low level risk- very low impact, acceptable & no financial loss

**20.What is alpha testing?**

* It is a type of software testing, which is performed to identify bugs before releasing product to real user/customer
* It is performed by testers, who are part of organization
* It is a type of user acceptance testing
* Alpha testing uses both white & black box testing
* Hence alpha testing required a testing lab/environment
* This testing ensures quality of product before forwarding to beta testing
* It requires long execution cycle

**21.What is beta testing?**

* It is a type of testing which is performed by customer/real users of the software application in a real environment
* It is performed by clients, who are not part of organization
* It is a type of user acceptance testing & also considered as pre-release testing
* Beta testing uses black box testing
* Beta testing does not require a testing lab/environment
* This testing is performed after alpha testing, to ensures quality of product & whether the product is ready for real time users or not
* Reliability & security are checked during beta testing
* It requires a few weeks of execution cycle

**22.What is component testing?**

* In this type of testing individual component/module/units are tested to check if there is any issue or bug
* Which helps to fix bugs early in the development cycle, save cost & time
* It is performed by developers
* It is also known as ‘Unit testing” & ‘Level-1’ testing

**23.What is GUI testing?**

* Graphical user interface testing is the process of testing product’s graphical user interface & the functionality of software application works as per specifications
* Checking screens with controls like menus & icons, all types of bars-tool bar, menu bar, dialog boxes & windows, buttons should be clickable, checking if user is able to resize the screen, error messages are displayed or not etc.

**24.What is adhoc testing?**

* When software testing is performed without proper planning & documentation it is called as ‘Adhoc testing”
* It is unstructured or informal testing with an aim to break the system & finding defects by random checking without any test cases or documents
* It takes comparatively lesser time than other testing techniques
* Adhoc testing is also called “error guessing” & Performed by experienced persons

**25.What is load testing?**

* It is a type of performance testing which determines the performance of system under load condition
* In this testing system is tested up to its load limit
* To check how system can handle heavy load
* In this testing peak performance & response time of system is checked, to determine the operating capacity of the system

**26.What is stress testing?**

* It is a type of performance testing in which system is tested above its load limit
* To check how the system behaves under extreme loads & how it recovers from failure
* In this testing system stability & response time is checked, to ensure any unexpected failure do not harm the system security

**27.Mention what are the categories of defects?**

* Data quality/database defects
* Critical functionality defects
* Functionality defects
* Security defects
* User interface defects

**28.Mention what big bang testing is?**

* It is a type of integration testing
* In big bang testing all modules integrated together at once & after that everything is tested as a whole

**29.When should “regression testing” to be performed?**

* 1.Before releasing a new version of the software
* 2.Whenever there is a change in requirement & new functionality is added to system & code is modified
* 3.When some defect is detected in the software & code is debugged to fix it
* 4.When testing software compatibility with different browsers, operating systems
* 5.When performance issues are fixed
* In above all condition regression testing is essential to check that existing functionality still works as expected

**30.Expalin the types of performance testing?**

* There are two types of performance testing:
* 1.Load testing: It is a type of performance testing which determines the performance of system under load condition
* 2.Stress testing: It is a type of performance testing in which system is tested above its load limit

**31.What is difference between SDLC & STLC?**

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| **SDLC** | **STLC** |
| 1.The objective of SDLC is successful development of software | 1.The objective of STLC is successful testing of software |
| 2.It includes testing & other software development phases | 2.It focuses only on software testing |
| 3.SDLC involves six phases | 3.SDLC involves five phases |
| 4. It helps in making good quality software | 4.it helps in making the software defect free |
| 5.In this development team makes plan & design based on requirement | 5.In this testing team makes plan & design |
| 6.More number of developers are required for whole process | 6.Less number of testers are required |

**32.What is priority?**

* Priority determines the urgency of defect repairing/how soon defect needs to be fixed by developer
* It deals with technical aspects of the application
* Value of priority may change after comparison with other defects
* Category of priority is set by product manager/customer

**33.What is severity?**

* Severity determines the impact of defect on the application/software, It deals with the time frame or order to fix defects
* Value of severity does not change with time, it is fixed
* Category of severity is decided by tester

**34.Bug categories are?**

* Functional bugs
* Compatibility bug
* Performance bug
* Usability bug
* Security bug
* Unit level bugs

**35.Advantage of Bugzilla?**

* It is an open source widely used bug tracker
* It is easy to use & provides user friendly interface, so it does not require any technical knowledge
* It integrates with an email system
* Easily integrates with test management tools

**36.What are different methodologies in agile development model?**

* Customer satisfaction by rapid delivery of useful software
* Allows Change in requirements even late in development
* Working software is delivered frequently
* Effective communication among team due to daily meeting
* Continuous attention to good design & technical excellence
* Self-organized team

**37.Explain difference between Authorization & Authentication in web testing. what are the common problems faced in web testing?**

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| **Authorization** | **Authentication** |
| 1.In authorization process user’s authorities are checked for accessing the resources | 1.In authentication process the identity of user is checked for providing access to the system |
| 2.In this process users are validated | 2.in this process users are verified |
| 3.It needs user’s security levels | 3.It needs user’s login details |
| 4.Authorization permission cannot be changed by users, as these are granted by the owner of the system & only owner has the access to change it | 4.Authentication credentials can be changed as & when required by user |

**38.When to use usability testing?**

* Usability testing is also known as user experience testing, which tests how easy & user-friendly the software application is
* This testing should be done during initial design phase, so that usability errors can be identified & resolved early in development cycle can save product from failure

**39.What is the procedure for GUI testing?**

* Check all GUI element for size, position, width & length
* Check user is able to provide inputs to input fields
* Check acceptance of characters & numbers in input fields
* Check error messages are displayed correctly
* Checking color of error messages & warning messages
* Check font used in application is readable
* Check the alignment of text is proper
* Check images are properly aligned & have good clarity
* Check links & buttons on screen are clickable
* Check that images should be completely visible in different browsers
* Check when user resizes the screen, images or content does not shrink or overlap or crop
* Checking of disabled field & scrollbar according to page size