**White box testing-----CODE Inner part**

**Testing the structural part of an application i.e** verifying the working flow for an applicationthat involves testing a series of predefined inputs against expected or desired outputs so that when a specific input does not result in the expected output, you have encountered a bug. **Usually the developers or white box testers perform it.**

They should have internal knowledge of the software program, internal code structure, implementation details and knowledge of internal paths of the software

**Black box testing-----Functionality of the application**

**testing only on the functional part of an application with out having any structural knowledge i.e we just focus on inputs and output of the software system**without bothering about internal knowledge of the software program, internal code structure, implementation details and knowledge of internal paths of the software

**Unit Testing----------F,WB**

**Integration Testing--------F,WB**

**System Testing--------------BB**

**Smoke Testing**

**Build Acceptance Testing Or Build Verification Testing Or Sanity Testing**

**User Acceptance Testing (U.A.T)---------F,BB**

**Regression Testing**

**End-To-End testing**

Types of Functional testing are

* Unit Testing
* Smoke Testing
* Sanity Testing
* Integration Testing
* White box testing
* Black Box testing
* User Acceptance testing
* Regression Testing

**Non – Functional**

Types of Non functional testing are

* Performance Testing
* Load Testing
* Volume Testing
* Stress Testing
* Security Testing
* Installation Testing
* Penetration Testing
* Compatibility Testing
* Migration Testing

**For Functional/ Regression Tests you can use -**[**QTP**](http://www.guru99.com/quick-test-professional-qtp-tutorial.html)**,**[**Selenium**](http://www.guru99.com/selenium-tutorial.html)

**For Non-Functional Tests, you can use - [Loadrunner](http://www.guru99.com/loadrunner-tutorials.html" \t "_blank), [Jmeter](http://www.guru99.com/jmeter-tutorials.html" \t "_blank)**

**Unit Testing---**first type of testing done on an application

Unit testing is performed on each unit or block of code as it is developed.

Unit testing is essentially done by the programmer. developer, develop a few lines of code, a single function or an object and test it to make sure it works before continuing

Unit testing helps identify majority of bugs, early in the software development lifecycle. Bugs identified in this stage are cheaper and easy to fix.

**Integration Testing**

Individual software modules/units are integrated logically and tested as a group i.e checking data communication amongst these modules.

Software project consists of multiple software modules, coded by different programmers

**Top-down approach develops the parent modules first and then integrates them with the related child modules**

**Bottom –up approach------ C—F**

**Hybrid or Sandwich approach-----Mix both**

**Big bang approach---will wait till all the modules are ready and finally they will integrate all the modules at a time**

**System Testing**

It is a level of testing in which one will install the complete application in to the environment and then perform testing on it. At this level different types of testing will be done one among those is system integration testing.

System integration Testing: -

It is a type of testing in which once the complete application is developed one will perform an action at one module and checks for the reflections at the corresponding modules. It is a black box testing and usually test engineers perform**.**

**Smoke Testing**

**just before releasing the build the developers will conduct the overall testing on the build**

**Sanity Testing**

**conduct over all testing on the released build in order to check whether it is proper for further detailed testing or not.**

**Regression Testing**

**It is a type of testing in which one will perform testing on the already tested functionalities again and again.**

**It is usually done in two scenarios.**

1. Retesting: **Whenever the testers has raised the defects, rectified by the developers and next build is released to the testing department then the test engineer’s will test the defect functionality as well as the related functionality once again.**
2. Regression: **When ever some new features are incorporated by the developers, next build is released to the testing department then the test engineers will once again test the related functionalities of the new features in order to confirm that they are working same as previous.**
3. **Performance Testing----** speed, stability and scalability of an application

is done to provide stakeholders with information about their application regarding speed, stability and scalability. More importantly, performance testing uncovers what needs to be improved before the product goes to market.

Load Testing

is a kind of performance testing which determines a system's performance under real-life load conditions. This testing helps determine how the application behaves when multiple users access it simultaneously

running slow while several users use it simultaneously, inconsistencies across different operating systems and poor usability. Performance testing will determine whether or not their software meets speed, scalability and stability requirements under expected workloads

This testing usually identifies -

* The maximum operating capacity of an application
* Determine whether current infrastructure is sufficient to run the application
* Sustainability of application with respect to peak user load
* Number of concurrent users that an application can support, and scalability to allow more users to access it.

Agile Methodology

**Continuous iteration** of development and testing throughout the software development lifecycle of the project. Both development and testing activities are parallel done

Agile Testing has shorter time frames called iterations/ Sprints (say from 1 to 4 weeks).at the end of each sprint, project priorities are evaluated and tests are run. These sprints allow for bugs to be discovered, fixed and customer feedback to be incorporated into the design before the next sprint is run.

Incremental testing is used in agile development methods and hence, every release of the project is tested thoroughly. This ensures that any bugs in the system are fixed before the next release

It is possible to make changes in the project at any time to comply with the requirements.

This incremental testing minimizes risks.

Scrum

SCRUM is an agile development method which concentrates specifically on how to manage tasks within a team-based development environment. Scrum believes in empowering the development team and advocates working in small teams (say- 7 to 9 members).

Scrum has short fixed schedule of release cycles with adjustable scope known as **sprints** to address rapidly changing development needs. Each release could have multiple sprints. Each Scrum Project could have multiple Release Cycles

Meetings

**What is Object Repository? How can we create Object Repository in Selenium?**

Object Repository is a term used to refer to the collection of web elements belonging to Application Under Test (AUT) along with their locator values. Thus, whenever the element is required within the script, the locator value can be populated from the Object Repository. Object Repository is used to store locators in a centralized location instead of hard coding them within the scripts.

In Selenium, objects can be stored in an excel sheet which can be populated inside the script whenever required.

Page Object Model in Selenium is a design pattern where web pages are represented using classes. Variables in the class can then be used to hold references to elements on the web page, and methods can be used to implement behaviors. This allows an elegant way of implementing test routines that are both readable and easier to maintain and extend in the future.

clickLoginButton();

setCredentials(user\_name, user\_password);

submitLoginForm();

Page Factory is used to initialize every WebElement variable with a reference to a corresponding element on the actual web page using configured “locators”. Annotations, such as @FindBy, can be used to define strategies for looking up elements, along with the necessary information for identifying them:

@FindBy(how=How.NAME, using="username")

private WebElement user\_name;

**Advantages of using Page Object Model**

* Increases code reusability - code to work with events of a page is written only once and used in different test cases
* Improves code maintainability - any UI change leads to updating the code in page object classes only leaving the test classes unaffected
* Makes code more readable and less brittle

 Daily Stand-Up?

Every day, preferably in the morning, the team meets for no more than 15 minutes to answer three questions:  
  
1) What did you do yesterday?  
2) What do you plan on doing today?  
3) Are there any blocks or impediments that keep you from doing your work?

* Any impediments / roadblock

This Scrum ceremony is not meant to be a status meeting for stakeholders, but a way to energize the team and get them to set focus for the day.

6. Describe what happens in the Sprint planning meeting.

In Sprint planning, the Product Owner presents the goal of the sprint and discusses the high priority product backlog items. The Delivery team then chooses the amount of work for the next sprint.

During scrum meeting

* Team analyze how much time they got to complete task during the Sprint
* From product backlog, team takes the first item and breaks into tasks
* Team estimates how long a task will take
* If there is any time left during the sprint, they will move on to the next item on the product backlog
* Decide the features which have clarity and estimates how many to be scoped for sprint

**20) Explain what is a story point in Scrum?**

Each feature in scrum is Story. Story point is an arbitrary measure used by Scrum

teams, and it is a metric used by agile teams to determine the difficulty of implementing a given story.

**21) Explain what velocity in scrum is and how it is measured?**

Velocity in a scrum is a measurement of how much the team gets work done in an iterations or sprint. It is measured by

* V= Number of total story points / One iteration

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Standups (or Daily Scrums)

**Frequency:** Daily, (Near) Start of Day  
**Duration:** 15 minutes  
**Purpose:** Brief status/update meeting  
**Attendees:** ScrumMaster, Team Members, Product Owner (if invited)

**Daily Scrum and Sprint Execution**: From the planning meeting, we move into the daily scrum meetings. Every single day for about 30 minutes, the team gathers together to report any issues or progress on their tasks. Though brief, this meeting is an essential part of the scrum process. It is designed to keep all group members on track in a cohesive manner. Normally the Product Owner is present during all daily scrum meetings to assist in any way.

Backlog Grooming (or Backlog Refinement)

**Frequency:** Once a Sprint, Before Next Sprint  
**Duration:** 30-45 minutes  
**Purpose:** Confirm clear acceptance criteria and prerequisites  
**Attendees:** Scrum Master, Team Members (Leads Only), Product Owner

*(Note: Project leads need to attend [e.g. the lead designer, the lead QA engineer, the lead developer, etc.])*

Backlog Grooming meetings were developed by teams frustrated with having to spend too much time in Sprint Planning meetings. This meeting allows for the leads of the project to work with the SM and the PO to get a set of clear acceptance criteria and prerequisites (e.g. designs, wireframes, decisions, permission/access, etc.) for one to two sprints worth of tickets.

Estimating does not happen during this meeting. This meeting is focused on getting the details on what the team is building, not how the team will build it.

Not all scrum teams find the Backlog Grooming meeting to be a necessity. Though, more and more scrum teams are saying that this meeting is an integral tool in running a smooth scrum cycle. We highly recommend it.

Sprint Demo (or Sprint Review)

**Frequency:** Once a Sprint, End of Sprint  
**Duration:** *Varies*  
**Purpose:** Demo and approve work that was completed during the sprint  
**Attendees:** ScrumMaster, Team Members, Product Owner, Stakeholders (if invited)

3. **Sprint Review Meeting**: This meeting is used to showcase a live demonstration of the work completed. During this meeting the Product Owner, Scrum Master and stakeholders are present to review the product and suggest changes or improvements.

4. **Sprint Retrospective Meeting**: This meeting is held to facilitate a team’s reflection on their progress. The team speaks openly about their organizational concerns and teamwork. During this meeting, dialogue should remain friendly, non-judgmental and impartial. This review session is a key part of team building and development and it’s also very important for future scrum projects.

**What do you do in a sprint review and retrospective?**

During Sprint review we walkthrough and demonstrate the feature or story implemented by the scrum team to the stake holders.

During retrospective, we try to identify in a collaborative way what went well, what could be done better and action items to have continuous improvement.

Sprint Retrospective

**Frequency:** Once a Sprint, End of Sprint  
**Duration:** 15-45 minutes  
**Purpose:** Look back to determine how to improve  
**Attendees:** ScrumMaster, Team Members, Product Owner (if invited)

The sprint retrospective gives the whole team a chance to look back at the sprint to determine what worked, what we could improve on and what we can try for the next sprint.

Sprint Planning

**Frequency:** Once a Sprint, Before Sprint Begins  
**Duration:** 30-60 minutes  
**Purpose:** Estimate tickets and forecast the next sprint  
**Attendees:** ScrumMaster, Team Members, Product Owner (if invited)

**Sprint Planning Meeting**: This meeting begins with the Product Owner. This is where he or she explains her vision for the project as well as ways for the team to meet this goal. During this meeting, team members decide the amount of work they can complete in a timely manner. This is also when the team moves work from the Product Backlog to the Sprint Backlog. This step requires a lot of planning and usually this takes around 8 hours for the group to decide on a finalized 30-day Sprint.

5. **Backlog Refinement Meeting**: The last type of scrum meeting reviewed in this article is the backlog refinement meeting. Team members focus on the quality and skill work involved during sprints. This meeting is necessary for the business owners to connect with the development team and is used to assess the quality and development of the final product. This meeting involves important reflection on the team backlogs. These backlogs are often written in User Story form and specify what makes the product useful to the consumer.

 Product backlog is maintained by the project owner which contains every feature and requirement of the product.

Sprint backlog can be treated as subset of product backlog which contains features and requirements related to that particular sprint only.

**14. How do you measure the work done in a sprint?**

It’s measured by Velocity.

**Q #15. What is Velocity?**

Velocity is the sum of story points that a scrum team completes (meets the definition of done) over a sprint.

**Q #16. So in scrum which entity is responsible for deliverable? Scrum master or Product owner?**

Neither the scrum master, not the product owner. It’s the responsibility of the team who owns the deliverable.

**Q #17. How do you measure the complexity or effort in a sprint? Is there a way to determine and represent it?**

Complexity and effort is measured through “Story Points”. In scrum it’s recommended to use Fibonacci series to represent it.

**Q #18. How do you track your progress in a sprint?**

The progress is tracked by a “Burn-Down chart”.

**Q #19. How do you create the burn down chart?**

Burn down chart is a graph which shows the estimated v/s actual effort of the scrum tasks.

It is a tracking mechanism by which for a particular sprint; day to day tasks are tracked

to check whether the stories are progressing towards the completion of the committed story points or not. Here we should remember that the efforts are measured in terms of user stories and not hours.