1. **Explain Agile Testing? What are the principles of Agile Testing?**

Agile testing is a software testing process where software is tested for any errors, or issues. It is considered as part of the development process as it enables testers and developers to work together as a team that in turn improves overall performance.

1. **What do you mean by the below?**

**Re-factoring** is basically an activity that involves modification of the internal structure of software without any change on its external behaviours.

**Scrum** is a lightweight process framework that helps scrum teams to work together for product development to deliver products in the shortest possible time.

**Sprint** is one timeboxed iteration of a continuous development cycle. Within a Sprint, planned work must be completed by the team and made ready for review.

**Epic** is basically a large story that cannot be fit in a single sprint. Therefore, epics are divided into smaller user stories.

**User story:**These are the smallest units that can be fitted in one sprint. User stories are further broken down into different tasks.

**Tasks** are detailed pieces of work that are necessary to turn user stories into workable components.

**Velocity** is basically a measurement that measures how much work an agile development team can successfully complete in a single sprint and how much time will be required to finish a project.

**Story point** is basically a unit to estimate total efforts that are required to complete. It gives more accurate measures, reduces planning time, predicts releases date more accurately.

**Pair Programming** is a type of programming where two people write code together and work side-by-side. In this, one person writes code and another person checks and reviews each line of code. Both also switch their roles while doing work.

**Scrum of Scrum (SoS)**: It coordinates the work of multiple teams who need to work together to deliver complex solutions. Its main is to ensure coordination and integration of output from multiple teams by eliminating impediments if present.

**Impediments** are something that blocks the progress of teamwork. It causes the team not able to perform their task in a better way and on time that in turn also slows down the velocity. It’s the responsibility of the Scrum master to resolve impediments. Possibilities are Missing resource, Technical or operational issue & Business problems.

**Increment** is simply the sum of all the product backlog items that were completed during a sprint and the value of increments of all previous sprints. It is the total work completed within the current and previous sprints.

**Product Roadmap** describes how a product is likely to grow over time. A product roadmap is owned by the product manager. It also encourages the development team to work together to achieve the desired goal for the successful delivery of the product.

1. **Principles of Agile Testing**

There are eight main principles of Agile Testing as given below:

*Continuous Testing; Continuous Feedback; Teamwork; Clean Code;*

*Less Documentation; Test-Driven; Customer Satisfaction:*

1. **What do you mean by Daily Stand-Up meeting?**

A daily stand-up meeting is a day-to-day meeting among all the members of the agile team. Its main purpose is to know the current progress and performance of every team member. This` meeting usually involves the product owners, developers, and the scrum master.

These meetings usually take place for the following reasons:

* To know what was done yesterday and what is the plan for today.
* To provide a better understanding of goals.
* To make sure that every team member is working toward the same goal.
* To bring everyone up to date on the information and help the team to stay organized.

1. **What is a Sprint Planning Meeting, Sprint Review Meeting and Sprint Retrospective Meeting?**

* **Sprint Planning Meeting:** In this meeting, the discussion takes place about features and product backlog items (user stories) that are important to the team. This meeting is usually attended by the product owner, Scrum Master and Scrum Team. It is a weekly meeting and usually lasts for about an hour.
* **Sprint Review Meeting:**In this meeting, the Scrum team gives a demonstration of the product. After this, the product owner determines which items completed and which are not completed. He also adds some additional items to the product backlog on the basis of feedback from customers or stakeholders. Its main aim is to inspect the product being created in the sprint and modify it if required.
* **Sprint Retrospective Meeting: In this meeting, the Scrum team meets again to inspect itself and discuss the past mistakes, potential issues and methods to resolve them. Main aim of this meeting is to improve the development process. This meeting lasts for about 2-3 hours**

1. **What's the difference between sprint backlog and product backlog?**

**Sprint Backlog:** It is generally owned by the development team. It only contains those features and requirements that are related to the specific sprint only. It is considered a subset of the product backlog.  
**Product Backlog:**It is generally owned and maintained by the project owner. It usually contains every feature of the product as well as the requirements of the product. It is compiled to everything that must be done to complete the whole process. It just breaks down every item into a series of steps. It is more specific to the end goal of the product.

1. **What is Spike and Zero Sprint in Agile?**

**Spike:** It generally refers to a too large and complex user story in software development that cannot be estimated until the development team runs a investigation. These stories can be used for various activities like research, design, exploration, prototyping, etc.

**Zero Sprint:** It generally refers to the first step or pre-preparation step that comes just before the first sprint. It includes all activities such as setting a development environment, preparing backlog, etc.

1. **What’s the difference between Agile methodology and Traditional methodology of Software Development?**

**Agile Software Development:** It is an iterative approach that is used to design complicated software. In this method, project teams are allowed to be more flexible and ensure that the final is fulfilling the customer’s requirements.

**Traditional Software Development:** It is a linear approach that is used to design simple software. In this method, all the phases of the process usually occur in sequence. It is more suitable for projects where the possibility of changes is negligible in the scope.

| **Agile Software Development** | **Traditional Software Development** |
| --- | --- |
| This approach is more focused on teamwork, flexibility, customer collaboration, and features. | This approach is more focused on upfront planning and gives importance to factors like cost, scope, and time. |
| In this, testing is usually done parallel to the development activity. | In this, testing is usually done at the end of the development activity. |
| In this, testing is done on small features. | In this, testing is done on the whole application. |
| It involves various stakeholders including customers in the development process. | It does not involve all stakeholders in the development process. |
| In this methodology, testers and developers work together as a team to achieve a goal. | In this methodology, testers and developers work separately. |
| They collaborate with customers in each and every step throughout the process. | They collaborate with customers only at the requirement phase. |
| Agile processes are more focused and flexible as compared to traditional processes. | The traditional process is less flexible as compared to the agile process. |
| This method is more suitable for large or more complex projects. | This method is more suitable for small or less complex projects. |

1. **What is Incremental and Iterative Development?**

**Iterative Development:** It is basically a software development process where software development cycles (sprint and releases) are repeated until the final product is obtained.   
**Incremental Development:** It is basically a software development process where development works are sliced into increments or pieces or portions. After testing each increment, they all are integrated so that they work as a whole.

1. **What is the difference between Agile and Scrum?**

**Agile:**It is an approach mainly used for software development. In this methodology, complex projects are broken down into smaller units that are achievable in a specific time frame. It always involves customers in the development process.   
**Scrum:**There are different agile methodologies, and Scrum is one of them. It promotes accountability, function, and teamwork like Agile.

| **Agile** | **Scrum** |
| --- | --- |
| It is a methodology that is used for software management and project management. | It is just a form of Agile that fully describes the process and its steps. |
| It emphasizes the incremental and iterative model known as sprints. | It is basically an approach or implementation of agile methodology. |
| It is best suited for projects that usually involve a small team of experts. | It is best suited for projects that require constant handling of changing requirements. |
| It is a long-term process. | It is a slow-term process. |
| It requires simple and straightforward design and execution. | It requires innovation, creating design, and execution. |
| In this, all tasks are handled and managed by the project head. | In this, all tasks and issues are addressed and handled by entire team members. |
| It emphasizes face-to-face communication to achieve desired goals. | It focuses on delivering maximum business value. |
| It is a less rigid method with more flexibility for change. | It is a more rigid method with less flexibility for change. |

1. **What is Agile Manifesto? What are its values and principles?**

The agile manifesto is basically a document consisting of values and principles that are expressed in Agile

1. **What are Burn-up and Burn-down charts in Agile?**

**Burn-up Chart:** It is a type of chart that is used to display or represent the amount of work that has been completed and the total amount of work for a sprint or iteration.     
**Burn-down Chart:** It is a type of chart that is used to display or represent the amount of work that is remaining to be completed in the project. These charts are very simple and easy to understand.

1. **What are different types of Burn-Down charts?**

Different types of Burn-Down charts are listed below:

* **Product Burndown Chart:** It is a type of chart that is used to show story points of each completed sprint so that it depicts the completion of requirements over time. It mainly shows how many of the product goals are being achieved by the team and how much work is remaining.
* **Sprint Burndown Chart:** It is a type of chart that is used to show the remaining works for the scrum team of a particular sprint. It makes the work of the team visible and shows the rate at which work is completed and how much is remaining to be completed.
* **Release Burndown Chart:** It is a type of chart that is used to show how a team is progressing against the work for a release. This chart is updated by the scrum team at the end of each sprint. It is very essential to see what process is being made during each sprint.
* **Defect Burndown Chart:** It is a type of chart that is used to show the total number of defects that are being identified and fixed or removed.

1. **What is Scrum? Write its advantages.**

Scrum is a lightweight process framework that helps scrum teams to work together and manage product development to deliver products in the shortest time. The product provided by the scrum team in the shortest period is known as a print.   
**Advantages of Scrum**

* Releases product quickly to users and customers
* Ensures effective use of time and money and therefore saves cost
* Best suited for fast-moving development projects
* Large and complex projects are divided into small and easily manageable sprints

1. **What are different roles in Scrum?**

**Scrum Master:** Scrum Master is basically a team leader or supervisor of a team who is responsible for ensuring that the scrum team executes committed tasks properly.   
**Product Owner:** The product owner is basically a stakeholder of the project who is responsible for managing the product backlog. He is also responsible for defining a vision of what to build for the team.   
**Development Team:** It involves an individual person and each person is responsible for working collectively to complete a particular project. It is the team that is responsible for developing actual product increments and meeting sprint goals.

1. **What do you mean by Scrum Master? What are the responsibilities of Scrum Master?**

Scrum Master is a person who is a master of Scrum i.e., the person who is responsible for managing and facilitating an agile development team and makes sure that the scrum framework is followed. Scrum master is also referred to as coach of the team that helps team members to do and give their best as much as possible.

**Responsibilities of Scrum Master**

* Protect the team from distractions
* Motivate and guide the team to achieve the sprint goal
* Increase efficiency and productivity of the team
* Ensures that the team delivers expected value during the sprint
* Eliminate external blockers and manage internal roadblocks

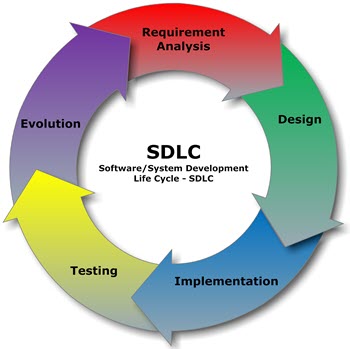
1. **Explain TimeBoxing in Scrum.**

It simply allows a fixed unit of time for each and every task and this unit is known as a time box.

* Sprint
* Sprint Planning
* Daily Scrum
* Sprint Review
* Sprint retrospective

**1) What Is SDLC?**

SDLC is an abbreviation of Software Development Life Cycle. SDLC is series of steps that offers a defined model for the development and lifecycle management of an application.



**2) Name five Models used in SDLC**

* Waterfall model
* Rapid Application Development (RAD) model
* Agile model
* Iterative model
* Spiral model

**3) Explain Phases of the waterfall model**

The five-main phase of waterfall model are:

* Requirements gathering
* Design
* Development
* Testing
* Implementation & Maintenance

**16) Who are the people involved in the phases of Waterfall Model**

* Business analyst
* Technical Manager or Senior Developers
* Technical Lead or System Architect in Design Phase
* Developers in Coding phase.
* Testers in Testing Phase.
* Project Manager, and Maintenance Team in the Maintenance phase

**20) What are problems faced in the waterfall model?**

* Waterfall model is not ideal for complex projects where requirements are not clear
* It needs lots of time to complete every stage
* There are certain bugs which never rectified in this model

# **Software Architecture**

Software Architecture consists of One Tier, Two Tier, Three Tier, and N-Tier architectures. A “tier” can also be referred to as a “layer”. Three layers are involved in the application namely Presentation Layer, Business Layer, and Data Layer.

1. Presentation Layer

It is also known as the Client layer. By using this layer, we can access the web pages. The main function of this layer is to communicate with the Application layer. This layer passes the information of user actions to the Application Layer.

2. Application Layer

It is also known as Business Logic Layer or logical layer. This layer acts as a mediator between the Presentation and the Database layer. Complete business logic will be written in this layer.

3. Data Layer

The data is stored in this layer. The application layer communicates with the Database layer to retrieve the data. It contains methods that connect the database and performs required action e.g.: insert, update, delete, etc.

### ****One Tier Architecture:****

One Tier application AKA Standalone application. One-tier architecture has all the layers such as Presentation, Business, Data Access layers in a single software package. The data is stored in the local system or a shared drive.

### ****Two-Tier Architecture:****

Two Tier application AKA Client-Server application. The Two-tier architecture is divided into two parts:

1. Client Application (Client Tier)

2. Database (Data Tier)

The client system handles both Presentation and Application layers and the Server system handles the Database layer. It is also known as a client-server application. The communication takes place between the Client and the Server. The client system sends the request to the server system and the Server system processes the request and sends back the data to the Client System

### ****Three-Tier Architecture:****

Three Tier application AKA Web Based application. The client system handles the Presentation layer, the Application server handles the Application layer, and the Server system handles the Database layer.

### ****N-Tier application****

N-Tier application AKA Distributed application. It is similar to the three-tier architecture but the number of application servers is increased and represented in individual tiers in order to distribute the business logic so that the logic will be distributed.

**Synchronous Vs Asynchronous:**

In synchronous operations tasks are performed one at a time and only when one is completed.

In asynchronous operations, we can move to another task before the previous one finishes.