1. **What is load testing?**

* Load testing is a performance testing to check system behavior under load. Testing an application under heavy loads, such as testing of a web site under a range of loads to determine at what point the system’s response time degrades or fails.
* 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
* 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.
* It is a type of non-functional testing. Load testing is commonly used for the Client/Server, Web based applications – both Intranet and Internet.

**Goals of load testing:**

* Loading testing identifies the following problems before moving the application to market or Production:
* Response time for each transaction
* Performance of System components under various loads
* Performance of Database components under different loads
* Network delay between the client and the server
* Software design issues
* Server configuration issues like Web server, application server, database server etc.
* Hardware limitation issues like CPU maximization, memory limitations, network bottleneck, etc.

**Pros of load testing:**

* Performance bottlenecks identification before production
* Improves the scalability of the system
* Minimize risk related to system down time
* Reduced costs of failure
* Increase customer satisfaction

**Cons of load testing:**

* Need programming knowledge to use load testing tools.
* Tools can be expensive as pricing depends on the number of virtual users supported.

**Tools for load testing:**

* Load runner
* Web Load
* Astra Load Test
* Review’s Web Load
* Studio, Rational Site Load
* Silk Performer

1. **What is stress testing?**

* Stress testing - System is stressed beyond its specifications to check how and when it fails. Performed under heavy load like putting large number beyond storage capacity, complex database queries, continuous input to system or database load.
* Stress testing is used to test the stability & reliability of the system. This test mainly determines the system on its robustness and error handling under extremely heavy load conditions.
* It even tests beyond the normal operating point and evaluates how the system works under those extreme conditions.
* Stress Testing is done to make sure that the system would not crash under crunch situations.
* Stress testing is also known as endurance testing.
* Most prominent use of stress testing is to determine the limit, at which the system or software or hardware breaks.
* It also checks whether system demonstrates effective error management under extreme conditions.
* The goal of stress testing is to analyze the behavior of the system after failure. For stress testing to be successful, system should display appropriate error message while it is under extreme conditions.
* The main purpose of stress testing is to make sure that the system recovers after failure which is called as recoverability.

**Types of stress testing**:

* Application Stress Testing
* Transactional Stress Testing
* Systemic Stress Testing
* Exploratory Stress Testing
* Neo Load
* App Perfect

**Metrics for Stress Testing:**

* Measuring Scalability & Performance
* Pages per Second: Measures how many pages have been requested / Second
* Throughput: Basic Metric – Response data size/Second
* Rounds: Number of times test scenarios has been planned Versus Number of times client has executed
* Application Response
  + Hit time: Average time to retrieve an image or a page
  + Time to the first byte: Time taken to return the first byte of data or information
  + Page Time: Time taken to retrieve all the information in a page
* Failures
* Failed Connections: Number of failed connections refused by the client
* Failed Rounds: Number of rounds it gets failed
* Failed Hits: Number of failed attempts done by the system

1. **When to used Usability Testing?**

* Usability Testing identifies usability errors in the system early in development cycle and can save a product from failure.
* Aesthetics and design are important. How well a product looks usually determines how well it works.
* There are many software applications / websites, which miserably fail, once launched, due to following reasons :
* Where do I click next?
* Which page needs to be navigated?
* Which Icon or Jargon represents what?
* Error messages are not consistent or effectively displayed
* Session time not sufficient.

1. **What is the procedure for GUI Testing?**

* Graphical User Interface (GUI) testing is the process of testing the system’s GUI of the System under Test. GUI testing involves checking the screens with the controls like menus, buttons, icons, and all types of bars – tool bar, menu bar, dialog boxes and windows etc.
* **WHAT DO YOU CHECK IN GUI TESTING?**
* Check all the GUI elements for size, position, width, length and acceptance of characters or numbers. For instance, you must be able to provide inputs to the input fields.
* Check you can execute the intended functionality of the application using the GUI
* Check Error Messages are displayed correctly
* Check for Clear demarcation of different sections on screen
* Check Font used in application is readable
* Check the alignment of the text is proper
* Check the Color of the font and warning messages is aesthetically pleasing
* Check that the images have good clarity
* Check that the images are properly aligned
* Check the positioning of GUI elements for different screen resolution.

**Approach of GUI Testing:**

* MANUAL BASED TESTING :
* Under this approach, graphical screens are checked manually by testers in conformance with• the requirements stated in business requirements document.
* RECORD AND REPLAY :
  + GUI testing can be done using automation tools. This is done in 2 parts. During Record , test steps are captured into the automation tool. During playback, the recorded test steps are executed on the Application under Test. Example of such tools - QTP.
* MODEL BASED TESTING :
* A model is a graphical description of system’s behavior. It helps us to understand and predict the system behavior. Models help in a generation of efficient test cases using the system requirements.