Non Functional Testing:

● Non-functional testing is a type of software testing to test non-functional parameters such as reliability, load test, performance and accountability of the software.
● The primary purpose of non-functional testing is to test the reading speed of the software system as per non-functional parameters.
● The parameters of non-functional testing are never tested before the functional testing.
● Non-functional testing is also very important as functional testing because it plays a crucial role in customer satisfaction.
● For example, non-functional testing would be to test how many people can work simultaneously on any software.
● Functional and Non-functional testing both are mandatory for newly developed software. Functional testing checks the correctness of internal functions while Non-Functional testing checks the ability to work in an external environment.
● Non-functional testing gives detailed knowledge of product behaviour and used technologies. It helps in reducing the risk of production and associated costs of the software.

Types Of Non-Functional Testing:

● Usability Testing
● Compatibility Testing
● Performance Testing
● Recovery Testing
● Security Testing

Usability Testing

● Usability Testing also known as User Experience(UX) Testing, is a testing method for measuring how easy and user-friendly a software application

● Usability testing is a method used to evaluate how easy a website is to use.

● User friendliness means application must be include below aspects:

- ○ Easy To Understand
- ○ Easy to access○ Look and Feel
- ○ Effective Navigation

Performance Testing:

● Testing the stability and response time of an application by applying load is called as performance testing

● Stability is nothing but the ability to withstand a design number of users is called stability.

● Response time is nothing but when a user requests to the server then server responds to that request so time between the request and response is the response time.

● Load is nothing but number of user using the application at particular time

Performance Testing Types:

1.Load Testing
2.Stress Testing
3.Scalability Testing
4.Volume Testing
5.Soak Testing

1.Load Testing:

● Testing the stability and response time of an application by applying the load which is less than the design number of users or equal to the design number of users is called load testing.

2.Stress Testing:

● Testing the stability and response time of an application by applying a load more than the design number of users is called stress testing.

3.Scalability Testing:

● Testing the stability and response time of an application by applying load which is more than the design number of users and we will try to find out where exactly software is crashing is called scalability testing.

4.Volume Testing

● Testing the stability and response time of an application by transforming the huge volume data is called volume testing.

● Volume testing is also called flood testing.

● Example:Suppose our application database capacity is 1 GB and we upload data more than 1 GB then the database will crash.

5.Soak Testing

● Soak testing is also called as endurance testing

● Testing the stability and response time of an application by applying load continuously for a long period of time is called soak testing.

Recovery Testing:

● Recovery Testing is software testing technique which verifies software's ability to recover from failures like software/hardware crashes, network failures etc.

● Recovery testing is the forced failure of the software to verify if the recovery is successful.

● Sometimes it is also carried out with load testing.

● Recovery testing is necessary to ensure your backup are successful.

● A system or software should be recovery tested for failures like :

- ○ Power supply failure
- ○ The external server is unreachable
- ○ Wireless network signal loss
- ○ Physical conditions
- ○ The external device not responding
- ○ The external device is not responding as expected, etc.

Examples:

● Suppose we are using the browser, let's say Google Chrome, and the power goes off. When we switch on the system again and re-open Google Chrome, we get a message window that displays whether we want to start a new session or restore the previous session.

● When data transferring is in progress then we will unplug the main cable of the pc and after sometime we will again connect the cable and we will check if data transferring is resuming or not.If data is transferring then we will check it is resume from last point or it is starting from start again.

● When the download is in progress it is downloaded 98% and after that if network issues occur then it will stop downloading but again when the network back then it will resume from 98% it means recovery done properly.

Compatibility Testing:

● Compatibility is nothing but the capability of existing or living together. In normal life, Oil is not compatible with water, but milk can be easily combined with water.

● Compatibility Testing is a type of Non-functional testing

● Compatibility Testing is a type of Software testing to check whether your software is capable of running on different hardware, operating systems, applications, network environments or Mobile devices.Or

● Checking the functionality of an application on different software, hardware platforms, network, and browsers is known as compatibility testing.

Types of Compatibility Testing:

1.Hardware: It checks software to be compatible with different hardware configurations.

2.Operating Systems: It checks your software to be compatible with different Operating Systems like Windows, Unix, Mac OS etc.

3.Software: It checks your developed software to be compatible with other software.

4.Network: Evaluation of performance of a system in a network with varying parameters such as Bandwidth, Operating speed, Capacity. It also checks application in different networks with all parameters mentioned earlier.

5.Browser: It checks the compatibility of your website with different browsers like Firefox, Google Chrome, Internet Explorer etc.

6.Mobile: Checking your software is compatible with mobile platforms like Android, iOS etc.

7.Versions of the software: It is verifying your software application to be compatible with different versions of the software. For instance checking your Microsoft Word to be compatible with Windows 7, Windows 7 SP1, Windows 7 SP2, Windows 7 SP3.

There are two types of version checking in Compatibility Testing :

1.Backward Compatibility Testing:

● Backward Compatibility Testing is a technique to verify the behaviour and compatibility of the developed hardware or software with their older versions of the hardware or software.

● Backward compatibility testing is much predictable as all the changes from the previous versions are known

2.Forward Compatibility Testing

● Forward Compatibility Testing is a process to verify the behaviour and compatibility of the developed hardware or software with the newer versions of the hardware or software.

● Forward compatibility testing is a bit hard to predict as the changes that will be made in the newer versions are not known.

Question:What is cross browser testing?
Answer:
● As name suggest cross browser testing means to test website or application on multiple browser
● It can be done on web and mobile
● Browser in which application needs to be tested is not decided by tester but it decided by client

Security Testing
● Security testing is performed to identify the security loopholes in the application and get it fixed, with an intention of protecting application data/information from getting hacked.
● It ensures software systems/applications are free from any vulnerabilities, Threats and risks that may cause big loss.

Principle Of Security Testing:
1.Confidentiality
2.Integrity
3.Availability
4.Authentication
5.Authorization
6.Non-Repudiation

1.Confidentiality:
● It is the most common aspect of security.
● It allows authorised users to access sensitive and protected data
● The data sent over the network should not be accessed by unauthorised user.
● Confidentiality is to be carried out to check if unauthorised user are not able to access the information.

● It is checked that the information stored in the database in the encrypted format & not stored in the plain format. Also check if while accessing the information by administrator or developer all information should be displayed in encrypted format or not.

2.Integrity:

● Integrity is to make sure that the information received is not altered during the transit & check if correct information presented to the user is as per the user groups, privileges & restrictions.
● Integrity means that changes need to be done by authorised entities and authorised mechanisms and nobody else should modify our data.

3.Availability:

● Data must be available for authorised users.
● Information is useless if we cannot access it.

4.Authentication:

● Authentication is a process of identifying the person before accessing the system. It allows user to access the system information only if authentication check got passed.
● Apart from Username & password combination, the authentication can be implemented in different ways like asking secret question and answer, OTP (One Time Password) over SMS, biometric authentication, Token based authentication like RSA Secure ID token etc. It is also possible to use combinations of above options for authentication.

5.Authorization:

● Once the Authentication passed the Authorization comes in the picture to limit the user as per the permission set for the user.
● The Authorization is generally implemented on Access control list, user role based, user group based and define the permissions

& restrictions tospecific user group or granting or revoking the privileges for the users.

6.Non-Repudiation:

● It is used as a reference to the digital security, and it a way of assurance that the sender of a message cannot disagree with having sent the message and that the recipient cannot repudiate having received the message.

● The non-repudiation is used to ensure that a conveyed message has been sent and received by the person who claims to have sent and received the message.