# **14. Test Plan and System Implementation Plan**

## **14.1 Testing Overview**

This is a two week testing and implementation plan which ensures that the Capital Radiology - Online System will meet all of its critical functional and non-functional requirements. Selenium will be used for web testing .

## **14.2 Testing Objective**

The primary objectives are:

* Validate critical functional requirements.
* Validate role based access control for all user roles
* Test Security and data protection measures
* Test system compatibility across Chrome , Firefox and Edge.
* Debug all bugs using the priority order(Critical, High , Medium, Low), within the given milestone.

## **14.3 Testing Approach**

**Testing Type :** Unit testing for all the modules , Web testing (via selenium) , Security , Performance & Compatibility Testing.

**Scope:** This test will incorporate all 17 system modules , core functional workflows, browser/device testing, Functional and non-functional requirements testing.

**Out-of-Scope :** Advance load testing , third party api testing and production server testing.

## **14. 4 Testing Execution Strategy**

**Week 1 - Core Testing**

* Setup Testing environment , collect and organize sample data , configure selenium and create test accounts
* Functional Testing for different system modules.
* Integration testing for cross-module workflows, data flow and email notification.

**Week 2 - Advance Testing and Implementation**

* Test image storage and retrieval , reporting , billing and security features.
* Cross-browser and mobile testing and limited load testing.
* User Acceptance testing, bug fixes and final system validation.

## **14.5 Selenium Test Framework**

This framework follows the Page Object Model for maintainability and reusability. Test data is in csv / json format . All system modules will be tested using this framework. Functional testing, cross-browser testing and UI testing will be done through selenium.

## **14.6 Test Data Management**

20 patient accounts , 3 technician accounts , 2 radiologist accounts and 2 admin accounts will be used as test users for the project. Sample of 88 DICOM images , 20 appointments and 20 billing samples will be used as test data.

## **14.7 Security Testing**

Security tests including privilege escalation for user-base access control , sql injection testing for authentication , encryption validation and Compliance testing which covers HIPAA (logs and encryption) and GDPR (consent and deletion).

## **14.8 Performance Testing**

A Light load test will simulate up to 50 concurrent users with a target of < 3 seconds for loading pages and < 2 seconds for login and <60 seconds for large Image uploads .

## **14.9 Mobile Testing**

Responsive design testing will cover various resolutions in the developer tools . The test will be done for Patient Portal . The test will incorporate testing features like navigation , booking , report viewing.

## **14.10 Bug Management**

Bugs will be prioritised as Critical , High , Medium or Low with the target of debugging within the given time frame.

## **14.11 Implementation Timeline**

Week 1:

Setting up test environment.

Testing core system modules for bugs.

Integration Testing using selenium.

Week 2:

Security Testing for Encryption , Privilege Control and authentication.

Compatibility tests and Performance testing using selenium.

Compliance tests and final deployment (User Acceptance Testing)

## **14.12 Test Environment Requirements**

Hardware: Laptop (8GB RAM , 4 cores) , Database server (laptop) and Test machine (windows , mac os )

Software : Latest Browsers , Selenium , Linux Machine (Security Testing)

## **14.13 Risk Management**

Risks include timeline delays, technical issues and security issues. It will be mitigated through including buffer time , progress tracking , Automated Testing and including security requirements from day 1(not as an afterthought).

## **14.14 Documentation and Handover**

Testing documentation includes execution reports, defect logs, performance results and browser compatibility reports. The documentation will also provide troubleshooting guides.