**1. Introduction**

**1.1 Purpose**

This test plan outlines the strategy, scope, objectives, resources, and schedule for testing the e-commerce web application. The goal is to ensure the application meets functional, performance, security, and usability requirements before deployment.

**1.2 Scope**

This test plan covers:

* Functional testing of user registration, login, product search, cart, checkout, and payment.
* Non-functional testing such as performance, security, and usability testing.
* Compatibility testing across different browsers and devices.
* API and database testing.

**1.3 Objectives**

* Verify that all features work as expected.
* Ensure smooth user experience and responsiveness.
* Identify and fix security vulnerabilities.
* Ensure the system handles concurrent users effectively.

**2. Test Approach**

**2.1 Testing Methodology**

We will use a mix of manual and automation testing following an Agile methodology.

**2.2 Test Levels**

* **Unit Testing**: Performed by developers to test individual components.
* **Integration Testing**: Verify interactions between different modules (e.g., checkout module integrating with payment gateway).
* **System Testing**: Test the complete system to ensure all components work together.
* **User Acceptance Testing (UAT)**: Validate the application with real users before production release.

**3. Test Scope**

**3.1 Features to be Tested**

1. **User Management**
   * User registration (email, social media login)
   * User login and logout
   * Password reset and recovery
2. **Product Management**
   * Product search and filtering
   * Product details page
   * Wishlist functionality
3. **Cart and Checkout**
   * Add/update/remove products from the cart
   * Apply discount codes and vouchers
   * Shipping and billing address management
4. **Payment Gateway**
   * Multiple payment options (Credit Card, PayPal, UPI)
   * Payment success and failure scenarios
   * Order confirmation and invoice generation
5. **Order Management**
   * Order tracking
   * Order cancellation and refunds
   * Email and SMS notifications
6. **Performance Testing**
   * Load testing to check how the system performs under heavy traffic
   * Stress testing to ensure the application remains stable
7. **Security Testing**
   * SQL Injection prevention
   * Secure password storage
   * Role-based access control
8. **Usability Testing**
   * User experience across different devices
   * Accessibility testing for differently-abled users

**3.2 Features Not to be Tested**

* Third-party integrations not developed in-house.
* Administrative backend (only user-facing functionality will be tested).

**4. Test Environment**

**4.1 Hardware Requirements**

* Servers: AWS Cloud / On-Premises
* User devices: Windows, macOS, Android, iOS

**4.2 Software Requirements**

* Browsers: Chrome, Firefox, Safari, Edge
* Database: MySQL/PostgreSQL
* Automation Tools: Selenium with Python, Pytest

**4.3 Test Data**

* User accounts with valid and invalid credentials
* Sample product listings
* Test payment card details

**5. Test Execution Plan**

**5.1 Test Cases**

Each feature will have detailed test cases, including expected and actual results with standard formate.

**5.2 Bug Reporting**

Defects will be logged in **JIRA** with priority and severity levels.

**6. Test Automation Strategy**

* **Tools**: Selenium with Python, Pytest for functional testing.
* **Scope**: Automate login, search, cart, checkout, and order functionalities.
* **Execution**: Daily scheduled runs on CI/CD pipeline (Jenkins).

**7. Risks and Mitigation Plan**

| **Risk** | **Impact** | **Mitigation Strategy** |
| --- | --- | --- |
| Last-minute requirement changes | High | Follow Agile best practices |
| High server response time | Medium | Optimize database queries |
| Browser compatibility issues | Medium | Test on multiple browsers |

**8. Test Deliverables**

* Test Plan Document
* Test Cases & Test Scripts
* Bug Reports
* Test Summary Report

**9. Exit Criteria**

* All critical and high-severity defects resolved.
* 100% functional test case execution completed.
* Performance and security benchmarks met.