EX.NO: 8 **Case Study: Test Plan for Library Management System**

DATE:

1. Introduction

The **Library Management System (LMS)** is designed to automate the operations of a library, including book issuance, return, cataloging, and user management. To ensure its reliability and efficiency, a comprehensive test plan is developed.

2. Objectives

The primary objectives of the test plan are:

- Validate the core functionalities of the system.
- Ensure system security and data integrity.
- Identify and resolve performance bottlenecks.
- Verify compatibility across different devices and browsers.

3. Scope

The test plan covers the following modules:

- **User Management** (Librarian, Members, Admin)
- **Book Management** (Add, Update, Delete Books)
- **Borrow & Return System** (Issue, Renew, Return Books)
- **Search and Cataloging** (Search Books, Categorization)
- **Reports and Logs** (Transaction History, Due Reports)

4. Test Strategy

4.1 Testing Types

- **Functional Testing**: Ensures each module works as intended.
- **Performance Testing**: Checks system response under load.
- **Security Testing**: Verifies data protection and user authentication.
- **Usability Testing**: Ensures user-friendliness of UI/UX.
- **Compatibility Testing**: Tests system behavior on different browsers and devices.

4.2 Test Approach

- **Manual Testing** for UI validation and exploratory tests.
- **Automated Testing** for regression and repeated test scenarios.

5. Test Environment

Component	Description
OS	Windows, Linux, macOS
Browsers	Chrome, Firefox, Edge
Database	MySQL
Backend	Node.js (Express.js)
Frontend	Bootstrap, React

6. Test Cases

6.1 User Management

Test Case ID	Test Scenario	Expected Result
TC_001	Register a new user	User successfully registered
TC_002	Login with valid credentials	User logs in successfully
TC_003	Login with invalid credentials	Error message displayed

6.2 Book Management

Test Case ID	Test Scenario	Expected Result
TC_004	Add a new book	Book added successfully
TC_005	Search for an existing book	Correct book details displayed
TC_006	Delete a book	Book removed from the catalog

7. Defect Management

- Defects will be logged in a bug tracking system (e.g., Jira, Bugzilla).
- Defect priority will be classified as **Critical, High, Medium, Low**.

8. Risk Assessment

Risk	Mitigation Strategy
System crashes under high load	Implement stress testing and optimize performance
Security vulnerabilities	Conduct thorough security testing
Data loss	Ensure database backup and recovery mechanisms

9. Test Schedule

- **Week 1:** Requirement analysis and test planning
- **Week 2-3:** Test case design and execution
- **Week 4:** Bug fixing and regression testing
- **Week 5:** Final testing and report generation

10. References

1. IEEE Standard for Software Test Documentation (IEEE 829-2008)
2. ISTQB Foundation Level Syllabus - Software Testing Principles
3. Myers, G. J., Sandler, C., & Badgett, T. (2011). The Art of Software Testing
4. Software Testing: A Craftsman's Approach by Paul C. Jorgensen

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Conclusion:

A well-structured test plan ensures that the Library Management System meets all functional and non-functional requirements. By following this test strategy, we can ensure a high-quality, reliable, and efficient system for library operations.

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