**Testing Phase for Cafe Management System (CMS)**

**The Testing Phase ensures the CMS is reliable, secure, and performs as expected before deployment.**

**1. Unit Testing**

* **Purpose: Test individual components or functions to verify they work correctly.**
* **Scope:**
  + **Login authentication (correct credentials, role checks)**
  + **Inventory update logic (stock adjustments after orders)**
  + **Menu item calculations (discounts, taxes)**
* **Tools: Jest (JavaScript), JUnit (Java), PyTest (Python)**

**2. Integration Testing**

* **Purpose: Verify that different modules work together seamlessly.**
* **Scope:**
  + **Order processing flow (from cart to payment)**
  + **Staff scheduling integration with shift notifications**
  + **Inventory syncing after sales and restocking**
* **Approach:**
  + **Top-Down: Test high-level modules first, then lower-level modules.**
  + **Bottom-Up: Start with lower-level modules, integrating them upward.**

**3. User Acceptance Testing (UAT)**

* **Purpose: Ensure the system meets stakeholders' requirements and is ready for real-world use.**
* **Participants: Cafe owners, staff, selected customers.**
* **Approach:**
  + **Scenario-Based Testing: Simulate real-life tasks like placing an order, managing inventory, generating reports.**
  + **Feedback Loop: Collect feedback, make adjustments, and retest as needed.**

**4. Performance Testing**

* **Purpose: Evaluate how the system performs under various conditions.**
* **Types:**
  + **Load Testing: Assess system behavior under expected user load.**
  + **Stress Testing: Push the system beyond limits to identify breaking points.**
  + **Scalability Testing: Determine if the system can handle increased load over time.**
* **Tools: JMeter, LoadRunner**

**5. Security Testing**

* **Purpose: Ensure data protection, secure authentication, and authorization mechanisms.**
* **Key Areas:**
  + **Authentication: Verify login security (password encryption, 2FA if needed).**
  + **Authorization: Ensure role-based access is correctly enforced.**
  + **Vulnerability Scanning: Check for common threats like SQL injection, XSS, CSRF.**
* **Tools: OWASP ZAP, Burp Suite**