**E-Commerce Website Testing Guide**

**1. Functional Testing**

Ensures that the website features work correctly.

**Homepage**

* Banner sliders, featured products, promotions, and categories load properly.
* Search bar functionality (search suggestions, results, and filters).
* Navigation menus and links work correctly.
* Login/Register functionality (email, social logins, OTP verification).

**Product Pages**

* Correct product details (title, description, price, stock status, SKU).
* Image gallery functionality (zoom, multiple images, videos).
* Variants (size, color, material) update correctly.
* Reviews and ratings are displayed properly.
* "Add to Wishlist" and "Compare" features work as expected.

**Shopping Cart & Checkout**

* Adding/removing/updating items in the cart.
* Cart price calculation (subtotal, taxes, discounts).
* Coupon code application.
* Shipping and billing address form validation.
* Payment options (credit card, PayPal, COD, etc.) process correctly.
* Order confirmation page and email notification work properly.

**User Account & Profile**

* User profile updates (name, email, password, address, payment methods).
* Order history and order tracking.
* Wishlist and saved items function correctly.

**Admin Panel (If applicable)**

* Product and order management.
* Discounts, coupons, and promotions management.
* User role management (admin, vendor, customer).

**2. Performance Testing**

Ensures the website loads quickly and handles traffic efficiently.

* Page load time (should be under 3 seconds).
* Stress testing (handling multiple users at checkout).
* Load testing (handling multiple products in the cart).
* Response time of API calls.
* Image and media file optimization.

**3. Security Testing**

Ensures the protection of user data and transactions.

**Login Security**

* Brute-force attack protection.
* Secure password policies.
* Multi-factor authentication (if enabled).

**Payment Security**

* Secure payment gateways (SSL/TLS encryption).
* Protection against fraudulent transactions.

**Data Protection**

* Secure user data storage (hashed passwords, encrypted sensitive data).
* Compliance with GDPR, PCI-DSS, etc.

**Vulnerability Testing**

* SQL injection, XSS, CSRF attack prevention.
* Proper session expiration and logout handling.

**4. Usability Testing**

Ensures a smooth and intuitive user experience.

* Mobile responsiveness and UI consistency.
* Readability and accessibility (contrast, font sizes, ARIA labels).
* Simple and clear checkout process.
* Navigation ease (breadcrumbs, categories, filters).
* Clear error messages and validation prompts.

**5. Compatibility Testing**

Ensures the website works across different devices and browsers.

* **Browsers:** Chrome, Firefox, Edge, Safari.
* **Devices:** Mobile, tablet, desktop.
* **Operating Systems:** Windows, macOS, iOS, Android.

**6. Payment & Checkout Testing**

Ensures all payment methods work correctly.

* Successful payments through different methods.
* Failed payment handling (error messages, retry options).
* Refund and cancellation processes.
* Currency conversion (if applicable).

**7. Order & Shipping Testing**

Ensures accurate order fulfillment.

* Different shipping options (standard, express, pickup).
* Address validation and shipping cost calculations.
* Order tracking updates.
* Email notifications (order confirmation, dispatch, delivery).

**8. SEO Testing**

Ensures the website is search-engine optimized.

* Meta tags, descriptions, and titles.
* URL structure and readability.
* Canonical tags and no duplicate content.
* Sitemap.xml and robots.txt validation.

**9. Localization & Internationalization Testing**

For multi-region e-commerce sites:

* Correct currency conversion and display.
* Language translations work properly.
* Region-specific products and promotions appear correctly.

**10. Database Testing**

Ensures data integrity and efficiency.

* Proper storage of user, product, and order data.
* Efficient query execution (no slow-loading pages).
* Proper indexing and caching for performance.

**API Testing**

API testing ensures that the backend services and integrations function correctly.

**1. Authentication & Authorization APIs**

**User Authentication (Login/Signup API)**

* Correct response for valid and invalid credentials.
* Token-based authentication (JWT, OAuth).
* Session expiration and renewal.
* Social login integration (Google, Facebook, etc.).

**User Roles & Permissions**

* Admin vs. customer access control.
* Secure handling of API keys and tokens.

**2. Product APIs**

* **Product Listing API:** Returns correct product details, supports pagination, sorting, and filtering.
* **Single Product Details API:** Validates correct responses for product IDs and handles errors properly.
* **Category API:** Fetches products by category and validates subcategory structure.

**3. Cart & Wishlist APIs**

* **Cart API:** Add, update, remove items; validate quantity limits; real-time price and tax calculation.
* **Wishlist API:** Add/remove items, retrieve saved wishlist for logged-in users.

**4. Checkout & Payment APIs**

* **Shipping & Billing Address API:** Validate fields, fetch saved addresses.
* **Order Placement API:** Ensure successful order creation, price calculation, order confirmation emails.
* **Payment Gateway API Integration:** Handle transactions, refunds, security compliance.

**5. Order & Shipping APIs**

* **Order History API:** Retrieve past orders, support pagination.
* **Order Tracking API:** Fetch real-time order status.
* **Shipping API:** Integrate with third-party shipping providers, validate addresses.

**6. User Management APIs**

* **User Profile API:** Fetch and update user details, profile picture upload.
* **Password Management API:** Forgot password functionality, secure password update.

**7. Admin Panel APIs**

* **Product Management API:** Create, update, delete products (admin-only access).
* **Order Management API:** Process cancellations, refunds, status updates.
* **User Management API:** Fetch, update, delete users, assign roles.

**8. Third-Party API Integrations**

* **Email Notification API:** Order confirmations, promotional emails, delivery tracking.
* **SMS & Push Notification API:** OTP validation, real-time delivery updates.
* **Tax & Currency Conversion API:** Validate tax calculations, currency conversions.

**9. API Performance Testing**

* Response Time: Ensure APIs return responses within acceptable limits (<1 sec ideally).
* Load Testing: Handle multiple concurrent requests efficiently.
* Rate Limiting: Protect against excessive API calls from a single source.

**10. API Security Testing**

* Data Protection: Ensure sensitive data (passwords, payment details) are encrypted.
* SQL Injection & XSS Protection: Prevent injection attacks via API endpoints.
* Access Control: Restrict unauthorized API access (e.g., normal users shouldn’t access admin APIs).