Quality? Meet the requirements.

Quality Assurance ?

An activity of checking goods or services to make sure that they are good., Meet the customer/user requirements.

Methodologies

1. Agile methodology is used frequently. (project is broken into chunks) > SCRUM comes under agile.
2. Waterfall (for extensive projects)

Software Testing

1. Review of SRS
2. GUI based review
3. Prototyping
4. Product level check review
5. End user review
6. Environment/server based review
7. Browser based review
8. Impact change review

SDLC PROJECT/PRODUCT

1. Requirement gathering (elicitation)
2. Design (layout, UI/UX, frontend, QA testing)
3. Development
4. Quality Assurance
5. Maintenance

https://validator.w3.org/

STLC Bug life cycle

1. Assign the bug
2. Dev will fix the bug
3. Dev will reassign bug to QA for verification
4. Process continues until issue closed

2. Methodologies

Agile Methodology

- **Overview**: Agile emphasizes iterative development, flexibility, and customer collaboration.

- **Key Features**:
    - Projects are divided into small increments (sprints).
    - Continuous feedback from stakeholders.
    - Adaptability to changing requirements.

SCRUM

- **Definition**: A framework within Agile that defines roles, events, and artifacts.
- **Roles**:
    - **Scrum Master**: Facilitates the process and removes obstacles.
    - **Product Owner**: Represents stakeholders and prioritizes the backlog.
    - **Development Team**: Self-organizing group that delivers increments.
- **Ceremonies**:
    - **Sprint Planning**: Define goals and tasks for the sprint.
    - **Daily Standup**: Short meetings to discuss progress and challenges.
    - **Sprint Review**: Demonstrate completed work to stakeholders.
    - **Sprint Retrospective**: Reflect on the process and identify improvements.

Waterfall Methodology

- **Overview**: A linear and sequential approach to software development.
- **Phases**:
    - **Requirements**: Gather and document all requirements.
    - **Design**: Create system architecture and design specifications.
    - **Implementation**: Actual coding and development.
    - **Verification**: Testing to ensure the product meets requirements.
    - **Maintenance**: Ongoing support and updates post-deployment.

3. Software Testing

Types of Reviews

- **SRS Review**: Evaluates the Software Requirements Specification for completeness, clarity, and feasibility.

- **GUI-Based Review**: Assesses the graphical user interface for usability, accessibility, and design consistency.
- **Prototyping**: Develops early models to validate concepts and gather user feedback before full-scale development.
- **Product-Level Check Review**: Comprehensive review of the product against requirements to ensure quality.
- **End User Review**: Engages actual users to validate usability and functionality based on real-world scenarios.
- **Environment/Server-Based Review**: Ensures the application runs correctly in the intended server and environment settings.
- **Browser-Based Review**: Tests application compatibility across different web browsers and devices.
- **Impact Change Review**: Analyzes how changes to the code affect the overall system and existing functionalities.

4. Software Development Life Cycle (SDLC)

Phases of SDLC

1. **Requirement Gathering (Elicitation)**
   - **Techniques**: Interviews, surveys, workshops, document analysis.
   - **Goal**: Collect comprehensive and clear requirements from stakeholders.
2. **Design**
   - **Components**:
     - Layout and user interface (UI) design.
     - User experience (UX) considerations.
     - Architectural design (frontend and backend).
   - **Quality Assurance Testing Strategies**: Plan testing strategies during the design phase to ensure quality requirements are met.
3. **Development**
   - **Process**: Actual coding and implementation based on design specifications.
   - **Best Practices**: Follow coding standards and conduct code reviews.

4. **Quality Assurance**
    - **Continuous Testing**: Perform testing throughout development to catch issues early.
    - **Types of Testing**: Unit testing, integration testing, system testing, user acceptance testing (UAT).
5. **Maintenance**
    - **Activities**: Bug fixes, updates, performance enhancements, and user support.
    - **Goal**: Ensure ongoing functionality and address new requirements.

5. Software Testing Life Cycle (STLC)

Bug Life Cycle

1. **Assign the Bug**: Bugs are reported and assigned to the development team.
2. **Fix the Bug**: Developers address the reported issues.
3. **Reassign to QA**: Fixed bugs are sent back to Quality Assurance for verification.
4. **Verification**: QA tests the fix to ensure the bug is resolved.
5. **Closure**: The process continues until the issue is resolved and marked closed.

Test Plan (most important document)

- **Overview**: A document outlining the overall testing approach.
- **Contents**:
    - Test objectives and scope.
    - Test scenarios and activities.
    - Resources and timelines.
    - Roles and responsibilities.

6. Additional Concepts

Test Automation

- **Definition**: The use of automated tools to execute tests, compare actual outcomes with expected results, and report outcomes.
- **Benefits**: Increases efficiency, reduces manual effort, and allows for more frequent testing.

Continuous Integration/Continuous Deployment (CI/CD)

- **Definition**: Practices that promote frequent integration of code changes followed by automated testing and deployment.
- **Benefits**: Reduces integration issues, enhances collaboration, and accelerates time to market.

Performance Testing

- **Purpose**: Assess the speed, scalability, and stability of an application under various conditions.
- **Types**:
    - Load Testing: Evaluates performance under expected load.
    - Stress Testing: Tests limits of the system under extreme conditions.
    - Endurance Testing: Checks system behavior under prolonged use.

Security Testing

- **Purpose**: Identify vulnerabilities, threats, and risks in software applications.
- **Techniques**: Penetration testing, risk assessment, and vulnerability scanning.