**Assignment – 1**

**Q1) What is Software Testing? Why is Software Testing Important?**

**Answer:**  
Software Testing is the process of evaluating a software application or system to identify whether it meets the specified requirements and functions correctly without defects. It ensures that the developed software is reliable, secure, and provides the expected output.

**Importance of Software Testing:**

1. **Ensures Quality** – Helps in delivering a high-quality product that satisfies customer needs.
2. **Detects Defects Early** – Identifies errors or issues in the development phase before deployment.
3. **Saves Cost & Time** – Fixing bugs early in the development cycle is cheaper than fixing them after release.
4. **Increases Customer Satisfaction** – A well-tested product improves trust and user experience.
5. **Ensures Security** – Testing prevents vulnerabilities that could lead to cyber-attacks or data breaches.

➡️ In summary, software testing is important to minimize risks, improve performance, and deliver a reliable product.

**Q2) What is Error, Bug, and Failure in Software Testing? Explain Example.**

**Answer:**

* **Error (Mistake):** A human mistake during coding, designing, or requirement gathering.
  + Example: A developer writes a = b + c instead of a = b - c.
* **Bug (Defect):** A problem found in the software due to an error in code or design. Bugs are detected during testing.
  + Example: The login page does not accept valid credentials because of wrong coding.
* **Failure:** When the software behaves incorrectly during execution due to an existing bug. Failures are visible to the end-users.
  + Example: A banking app transfers incorrect balance due to a calculation bug.

➡️ **Relation:**  
Error (by developer) ➝ Bug (in code) ➝ Failure (during execution).

**Assignment – 2**

**Q3) Explain Types of Software Testing.**

**Answer:**  
There are two broad categories of Software Testing: **Manual Testing** and **Automation Testing**. Within these, several types exist:

1. **Unit Testing** – Testing individual components/modules of the software (done by developers).
2. **Integration Testing** – Ensuring different modules work correctly when combined.
3. **System Testing** – Testing the complete system as a whole to check overall functionality.
4. **Acceptance Testing** – Ensuring the system meets user requirements (often done by end-users).
5. **Regression Testing** – Re-checking the system after changes/updates to ensure old functions still work.
6. **Performance Testing** – Testing speed, scalability, and stability under load.
7. **Security Testing** – Identifying vulnerabilities and protecting data from attacks.
8. **Usability Testing** – Checking if the software is user-friendly and easy to use.

➡️ Each type of testing has a role in ensuring that software is reliable, secure, and performs well under real conditions.

**Q4) What are Test Cases? Why are they important in Software Testing? Create 5 Test Cases for a User Registration Form (Name, Email, Password).**

**Answer:**  
A **Test Case** is a set of conditions, inputs, and expected results created to verify that a software feature works as intended.

**Importance of Test Cases:**

1. Ensure all functionalities are verified.
2. Help in systematic testing to avoid missing scenarios.
3. Provide documentation for future testing.
4. Improve software quality by detecting hidden issues.
5. Save time in regression and automated testing.

**Sample 5 Test Cases for User Registration Form:**

| **Test Case ID** | **Description** | **Input Data** | **Expected Result** |
| --- | --- | --- | --- |
| TC-01 | Verify Name field accepts only alphabets | Name = "Zack" | Registration successful |
| TC-02 | Verify Email format validation | Email = "zack@gmail.com" | Registration successful |
| TC-03 | Check invalid Email format | Email = "zackgmail.com" | Error message: "Invalid Email" |
| TC-04 | Verify Password minimum length (8 characters) | Password = "1234" | Error message: "Password too short" |
| TC-05 | Verify successful registration with valid Name, Email, and Password | Name = "Zack", Email = "zack@gmail.com", Password = "Test@1234" | Registration successful and user redirected |