

Assignment – 1

1. What is quality?

Quality is generally understood as the degree to which a product, service, or process meets certain standards, fulfills its intended purpose, or satisfies customer expectations. However, its meaning can vary depending on context. Here are some key perspectives on quality:

1. **Customer-Based Perspective:** Quality is meeting or exceeding customer expectations. From this view, a product or service is of high quality if it aligns well with customer desires and provides satisfaction.
2. **Product-Based Perspective:** Quality is determined by the measurable characteristics of a product, such as durability, reliability, or features. Higher quality means higher performance or more features.
3. **Manufacturing Perspective:** Quality is conformance to specifications. In manufacturing, if a product is produced according to exact design specifications and without defects, it is considered high quality.

2. Difference between QA and QC?

QA	QC
QA stands for Quality Assurance	QC stands for Quality Control
QA is a process oriented	QC is a product oriented
QA is responsible for preventing defects	QC is responsible for finding defects
QA is involved during the development phase.	QC is not included during the development phase.
QA is a managerial tool.	QC is a corrective tool.
Pays main focus is on the intermediate process.	Its primary focus is on final products.
QA is a less time-consuming activity.	QC is a more time-consuming activity.

3. Define errors, bugs and defects?

Error: Any incorrect human action that produces a problem in the system is called an error.

Defects/Bug: Deviation from the expected behavior to the actual behavior of the system is called defects.

4. What are the benefits of QA?

Prevents Defects Early: QA identifies and resolves issues early in the process, reducing the chance of defects reaching the final product.

Increases Product Reliability: QA ensures the product meets quality standards consistently, making it more reliable for users.

Reduces Costs: Catching defects early lowers the cost of fixes and minimizes rework needed later in the development cycle.

Enhances Customer Satisfaction: QA helps create a high-quality product, leading to better customer satisfaction and loyalty.

Builds Brand Reputation: Consistently delivering quality products strengthens the brand's reputation and trust in the market.

5. What are the basic testing principles?

Here are the seven basic principles of testing:

1. **Testing Shows Presence of Defects:** Testing can demonstrate that defects exist but cannot prove that there are no defects. Even with extensive testing, a product may still have undiscovered issues.
2. **Exhaustive Testing Is Impossible:** Testing every possible input and scenario is impractical. Instead, testers focus on the most critical functionalities and risk-prone areas.
3. **Early Testing:** Testing activities should start as early as possible in the software development lifecycle to detect and prevent defects early, reducing cost and effort.
4. **Defect Clustering:** A small number of modules often contain the majority of defects. Testing efforts can be focused on these high-risk areas.
5. **Pesticide Paradox:** Running the same tests repeatedly will eventually stop finding new defects. Regularly reviewing and updating test cases helps discover more issues.
6. **Testing Is Context-Dependent:** Testing approaches vary based on the software's purpose, user base, and environment. Different systems (e.g., financial, e-commerce) require different testing strategies.

7. **Absence-of-Errors Fallacy:** Even if a system has few or no defects, it may still fail to meet user needs or expectations. Testing should focus not only on defect detection but also on ensuring the software is useful and meets requirements.

6. Explain various phases of SDLC?

The various phases of SDLC are:

Requirement Gathering and Analysis:

- Understand what the client needs.
- Collect and document all software requirements.

System Design:

- Plan the software's structure and how it will function.
- Create designs for the overall system and individual components.

Implementation (Coding):

- Write the actual code for the software.
- Turn designs and requirements into a working program.

Testing:

- Check for errors and confirm the software meets requirements.
- Perform different types of testing to ensure quality.

Deployment:

- Release the software to the users.
- Make the software available in the live environment.

Maintenance:

- Fix any issues that come up after release.
- Update and improve the software as needed over time.

7. Define Pareto Principle?

The **Pareto Principle**, also known as the **80/20 Rule**, states that roughly 80% of the effects come from 20% of the causes. This principle was named after Italian economist Vilfredo Pareto, who observed that 80% of Italy's wealth was owned by 20% of the population.

In various fields, the Pareto Principle can be applied as follows:

- **Business:** 80% of sales come from 20% of customers.
- **Software Development:** 80% of bugs are often found in 20% of the code.
- **Productivity:** 80% of results come from 20% of efforts.

8. Difference between verification and validation?

	Verification	Validation
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Definition	Verification refers to the set of activities that ensure software correctly implements the specific function.	Validation refers to the set of activities that ensure that the software that has been built is traceable to customer requirements.
Focus	It includes checking documents, designs, codes, and programs.	It includes testing and validating the actual product.
Types of Testing	Verification is the static testing.	Validation is the dynamic testing.
Execution	It does <i>not</i> include the execution of the code.	It includes the execution of the code.
Purpose	It checks whether the software conforms to specifications or not.	It checks whether the software meets the requirements and expectations of a customer or not.
Timing	It comes before validation	It comes after verification
Bug	It finds bugs in the early stage of the development.	It can only find the bugs that could not be found by the verification process.

9. What is the Full form of ISO?

The full form of **ISO** is the **International Organization for Standardization**. It is a non-governmental organization that develops and publishes international standards across various industries to ensure quality, safety, efficiency, and interoperability. The name "ISO" is derived from the Greek word "isos," meaning "equal."

10. Explain Budgets for QA / Cost of QA (Graph)

Components of QA Costs

1. Personnel Costs:

- Salaries and benefits for QA engineers and testers.
- Training and development costs for upskilling the QA team.

2. Testing Tools and Environment:

- Licensing fees for testing tools (automation tools, performance testing tools).

- Infrastructure costs (servers, test environments).

3. Testing Activities:

- Costs associated with various types of testing (manual, automated, regression testing).
- Expenses for test case creation, execution, and reporting.

4. Process Improvement:

- Investments in improving QA processes and methodologies (e.g., implementing Agile, DevOps practices).

5. Defect Management:

- Costs related to identifying, tracking, and fixing defects in the software.

6. Compliance and Certification:

- Expenses for compliance with industry standards (ISO, CMMI) and certifications.

11. What is Test Case?

The test case is defined as a group of conditions under which a tester determines whether a software application is working as per the customer's requirements or not. Test case designing includes preconditions, case name, input conditions, and expected result. A test case is a first level action and derived from test scenarios.

12. What are Audits and inspections?

Aspect	Audits	Inspections
Definition	Systematic examination of processes or documentation.	Detailed examination of specific items or processes.
Purpose	Assess compliance and effectiveness.	Verify conformity to specifications or standards.
Scope	Broader, organizational focus.	Narrower, focused on specific products or processes.
Conducted By	Can be internal or external auditors.	Often conducted by quality control teams or inspectors.

Focus	Overall practices and compliance with regulations.	Specific items, products, or processes.
Outcome	Audit report with findings and recommendations.	Inspection report detailing defects or compliance.

13. What is Alpha, beta testing and GA?

Aspect	Alpha Testing	Beta Testing	General Availability (GA)
Definition	Internal testing by a small group.	External testing by a larger group.	Product released for public use.
Purpose	Identify bugs before external release.	Gather user feedback in a real-world environment.	Provide stable software to all users.
Environment	Controlled (internal).	Uncontrolled (real-world).	Public (available for purchase/download).
Feedback	Collected from internal testers.	Collected from external users.	Ongoing support and updates as needed.
Outcome	More stable version for further testing.	Final adjustments before official release.	Stable software ready for production.