Assignment 1

Q.1 Write Definition of

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I) Quality Analysis

Quality Analysis (QA) involves the Systematic examinition of the components and attributes of a Product or System to determine whether it meets Specified requirements. QA focuses on the Processes used to create a Product and ensures that these Processes are followed correctly to Prevent defects in the final Product.

-> QA is Proactive & Preventive in nature

-> Process definition, implementation, training, audits & Process monitoring.

II) Quality Control

Quality Control (QC) is the Process of inspecting & Testing Products to ensure they meet the required quality Standards. QC involves identifying defects in the final Products & making decisions to accept or reject the Product based on these inspections. QC is often seen as a reactive Process, identifying & addressing defects after they have occured.

-> QC is Reactive & corrective in nature.

-> It identify defects after a product is developed and before it's released.

Q.2 Write diffrence between quality Assurance & Quality control.

Ans

QA	QC
• QA Stands for Quality Assurance	Qc Stands for Quality control.
• It's a Procedure that foc -uses on Providing assuran -ce that quality requested will be achieved	It's a Procedure that focuses on fulfilling the quality requested.
• QA tends to Prevent the defect.	Qc tends to identify and fix the defect.
• It's a method to Manage the quality verification	It's used to verify the quality i.e. Validation.
• It dosen't involve execu -ting the Program	It always involves executing the Program.
• QA is the Preventive technique	Qc is the corrective technique.
• It is a Proactive measure	It is a reactive measure
• It's the Procedure to create the delieverabls	It is a Procedure to verify delieverables.

- In order to meet the customer requirements QA defines standard & methodologies.

where, in QC it confirms that the standards are followed while working on the Product.

- It is Perform before Quality control.

It is Perform only after QA is done

Q.3 Why is Quality important in SQA ?

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Quality is crucial in SQA for several reasons :

- Customer Satisfaction :
   High - Quality Software meets or exceeds customer expectations, leading to customer Satisfaction and loyality.

- Cost Efficiency :
   Detecting defects early in the development Process is less expensive than fixing them after Product has been released.

- Reputation :
   Consistently delivering high - Quality Software enhances the company's reputation and Credibility.

- Compilance :

Ensure that the Software compiles with industry standards and regulations.

- Performance :

Quality Software Performance reliably and effectively under Specified conditions

- Security :

Ensures the Software is secure from vulnerabilities & threats

- User Experience :

High-quality Software Provides a better user experience, making it easier & more enjoyable to use.

Q 4   Types of Software Metrics ?

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1. Product Metrics :
- Size Metrics :

measure the size of the software, Such as lines of code (loc).

- Complexity Metrics :

Measure the complexibility of the Software such as cyclomatic complexibility

- Quality Metrics :

Measure the quality of the software, Such as defect density

2. Process Metrics :

- **Efficiency Metrics :**
  Measure the effciency of the development process, such as the time taken to complete specific tasks.

- **Effectiveness Metrics :**
  Measure the effectiveness of the process, such as the number of defects found during testing.

3. Project Metrics :

- **Cost Metrics :**
  Measure the cost of Project, such as actual versus budgeted cost.

- **Schedule Metrics :**
  Measure the Project schedule, such as actual versus planned timelines.

- **Productivity Metrics :**
  Measure the Productivity of the development team, such as the amount of code produced per developer per month.

Q.5 Measure Reliability and Availability of Software Quality.

Ans

Reliability :

- **Mean Time Between Failures (MTBF) :**
  Average time Between System failures.

- Mean Time to Failure (MTTF):
  Average time until the first failure occurs.
- Defect Density:
  Number of defects per unit size of the
  Software (eg. KLOC)

Availability:
- Uptime Percentage:
  The Proportion of time the Software is
  operational & available for use.
- Mean Time to Repair (MTTR):
  Average time taken to repair a System after
  a failure.
- Service Level Agreements (SLAs):
  Agreements Specifying the expected uptime
  & availability levels.

Q.6 Factors Affecting the Quality of a Software
     Product.
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- Requirements Quality :
  Clear, complete & well-documented requirements
- Design Quality :
  Robust & well-architected design.
- Code Quality :
  clean, efficient & well-documented code
- Testing :
  Comprehensive testing strategy, including unit
  integration, system & acceptance testing

- Development Process :
  Effective development methodologies & Practices.
- Team Skills :
  Skills & experience of the development & testing teams.
- Tools & Technologies :
  Appropriate & up-to-date tools & technologies.
- Management :
  Effective Project management & leadership
- User Involvement :
  Active involvement of end-users in the development Process.
- External Factors :
  Compilance with industry standards, regulations & market conditions.

29/7/23 -> These factors collectively influence the final quality of software Product, impacting it's performance, reliability & user satisfaction.