

ANSWER EACH QUESTION

Q1) Software quality factors (6 Marks)

Read the following passage and answer questions

“The new version of our loan contract software is really accurate. We have already processed 1200 customer requests, and checked each of the output contracts. There were no errors. **But** we did face a severe unexpected problem – training a new staff member to use this software takes about two weeks. This is a real problem in customer departments suffering from high employee turnover

a) What quality factor is missing

→ **Usability**

b) How can you reformulate requirements document in order to ensure the problem described above will not happen.

→ **User-Friendly Interface**

→ **Training and Onboarding Support**

→ **Efficient Workflow**

→ **Feedback Mechanisms**

→ **Usability Testing**

c) Explain the following factors: **testability, portability, reusability**

→ **testability: Testability requirements deal with the testing of an information system as well as with its operation.**

→ **portability: Portability requirements tend to the adaptation of a software system to other environments consisting of different hardware, different operating systems, and so forth. It make possible to use the software in different SW and HW simultaneously.**

→ **reusability: Reusability requirements deal with the use of software modules originally designed for one project in a new software project currently being developed.**

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Q2) Software quality assurance components (4 Marks)

a) What are the main elements discussed in software quality plan. Explain each.

→ **1. List of quality goals** → Refers to the developed software quality requirements. The quality goals should reflect the major acceptance criteria indicated in the customer's requirement document (i.e., the RFP document). As such, quality goals serve as measures of the successful achievement of the customer's quality requirements.

→ **2. Review activities** → A list of all SDLC activities and deliverables to be reviewed to ensure that quality meets requirements

→ **3. Software tests** → The quality plan should provide a complete list of planned software tests, with the following designated for each test

→ **4. Acceptance tests for software externally developed** → A complete list of the acceptance tests planned for externally developed software should be provided within the quality plan

→ **5. Configuration management tools and procedures** → The quality plan should specify configuration management tools and procedures, including those change-control procedures meant to be applied throughout the project.

b) In the software project life cycle component, a **review** is one component to ensure software quality. List and explain two other components

→ **Expert opinions:** Expert opinions support quality assessment efforts by introducing additional external capabilities into the organization's in-house development process.

→ **Software testing:** formal SQA components that are used to review the actual running of the software.

c) What are templates and checklists? How can they contribute to wards the improvement of software quality ?

→ **templates and checklists:** One way to combine higher quality with higher efficiency is to use supporting quality devices

→ **Saving the time required to define the structure of the various documents or prepare lists of subjects to be reviewed.**

→ **Contributing to the completeness of the documents and reviews.**

→ **Improving communication between development team and review committee members by standardizing documents and agendas.**

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Q3) Software Quality Planning and control (6 Marks)

- a) Define **Quality control** and **Quality assurance**. Give an example for each one.

→ **Quality control:** a set of activities for ensuring quality in software products. The activities focus on identifying defects in the actual products produced.

→ **Example Quality control:** Reviews

→ **Quality assurance:** a set of activities for ensuring quality in software engineering processes (that ultimately result in quality in software products). The activities establish and evaluate the processes that produce products.

→ **Example Quality assurance:** Training

- b) "After Mohammad finished the preparation of testing plans for the hotel booking application, he has given a copy of the plan to his colleague Ali to review the plan and list his comments or concerns" what do we call this type of review ? Is there another review type ?

→ **Peer Review**

→ Another type: **Technical Review" or "Inspection"**

- c) What is software document **sign-off**

→ **Software or documents may be 'signed off' at a review which signifies that progress to the next development stage has been approved by management.**

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Classify this errors to The causes of software errors which can be further classified as follows according to the stages of the software development process in which they occur.

1. Absence of vital requirements.
→ Faulty requirements definition
 2. Due to time or budget pressures, the developer decides to omit part of therequired functions in an attempt to cope with these pressures.
→ Deliberate deviations from software requirements
 3. Definitions that represent software requirements by means of erroneous algorithms.
→ Logical design errors
 4. Incomplete test plans leave untreated portions of the software or the application functions and states of the system.
→ Shortcomings of the testing process
 5. Failures to document and report detected errors and faults.
→ Documentation errors
 6. Omission of software functions
→ Deliberate deviations from software requirements"
 7. Erroneous definition of boundary conditions
→ Faulty requirements definition
 8. Individuals replacing the “non-complying” team member.
→ Client-developer communication failures
 9. Process definitions that contain sequencing errors
→ Faulty requirements definition
 10. Misunderstanding of the client’s responses to the design problems
→ Client-developer communication failures
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1. -The objective of ISO-9000 family of Quality management is

- a. Customer satisfaction
- b. Employee satisfaction
- c. Skill enhancement
- d. Environmental issues

(Ans:a)

2. -Total Quality Management (TQM) focuses on

- a. Employee
- b. Customer
- c. Both (a) and (b)
- d. None of the above

(Ans:c)

3. -Which of the following is responsible for quality objective?

- a. Top level management
- b. Middle level management
- c. Frontline management
- d. All of the above

(Ans:a)

4. Software engineers don't strive to control the

- a. process applied
- b. resources expended
- c. end product quality attributes
- d. None of the above

(Ans:d)

5. The degree to which a system, component, or process meets specified requirements is definition of.

- a) Software quality
- b) Quality assurance
- c) quality attributes
- d) None of the above

(Ans:A)

6. A systematic, planned set of actions necessary to provide adequate confidence that the software development process or the maintenance process of a software system product conforms to established functional technical requirements as well as with the managerial requirements of keeping the schedule and operating within the budgetary confines.

- a. Software quality
- b. Quality assurance
- c. quality attributes
- d. None of the above

(Ans:B)

7. Software quality can be seen from different perspectives Complete requirement is the :

- a. Customer
- b. Project manager
- c. Maintenance engineer
- d. User
- e. (Ans: A)

8. Defects in software products can be detected by sight

- ☐ True
- ☒ False

9. Quality assurance activities are part of the total range of quality control activities

- ☐ True
- ☒ False

10. Some software faults end with software failures

- ☒ True
- ☐ False

11. Contract review activities include:

- ☒ A .Clarification and documentation of the customer's requirements
- ☐ b. Evaluation of the professional staff's capacity to carry out the proposed project
- ☒ c.All of the above
- ☐ d.Review of the project's schedule and resource requirement estimates

12. ____ provide detailed directions for the use of methods that are applied in unique instances and employed by specialized teams

- ☒ a.Work instructions
- ☐ b.Configuration management
- ☒ C.None of the above
- ☐ d. QA procedures

13. The main components of software project life cycle component are:

- ☐ a.Expert opinions
- ☐ b.Software testing
- ☒ c.All of the above
- ☒ d.Reviews

14. Quality checklists are used to:

- ☒ a. Ensure that Quality Assurance steps were followed
- ☐ b. Keep quality inspectors busy
- ☐ c. Inform upper management where failures occur
- ☐ d. Prevent project audits

15. Documentation and data on existing products are the examples of _____

External inputs

Internal inputs

Other inputs

None of the above options

The main objective of the Peer review process is

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a.To suggest improvements to SQA components.

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b.to detect as many design and programming faults as possible

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c.to issue the DR report

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d.To detect deviations from SQA procedures and methodology