

Noorul Islam College of Engineering
Department of Software Engineering

Part A Questions and Answers

Software Quality Assurance – XCS021

Unit I

1. Define Total Quality Management?
TQM- Total Quality Management means the use of control techniques for making and achieving goals. Software TQM must include the use of plans, analysis and control of software and the goals that cause quality software to happen
2. What is purpose of Management Information System?
Purpose is to supply management with information required to reach some polices and make plan
3. Name the two methods to select Software Model?
Model should address the subject or problem domain. The model should be widely accepted in the Market.
4. What is Continuous Process Improvement?
The implementation of TQM in an Organization forces the Management to practice CPI. The concept of TQM is intended to guide the Quality Assurance Practitioner in Planning and Organizing the Software Quality produced by the Organization. Software Engineering is the iterative System
5. Define Quality Assurance?
A planned and Systematic pattern of all actions necessary to provide adequate confidence that the material, data, supplies and Services confirm to establish technical requirements and achieve satisfactory performance
6. What is the Ethics in SQA?
The SQA practitioners will normally access corporate data as well as personal data that are confidential. The successful establishment of a SQA entirely depends upon the corporation and consensus ethics between developers and management. Bad ethics is not a bad practice, it is stupidity
7. Name the 3 parts in S/W Quality process?
The S/W Quality process consists of 3 parts are Requirements, Confidence and Constant improvement
8. What is Y2K?

Year 2000 problem also called as Y2K problem or millennium problem or century problem or thousand year glitch

9. Define programmer's responsibilities of Y2K problems?

Moore law states that computing power increases by 48% per year. The power of programming languages increases every year by 11% but the programming skills of programmer's increases by 4.8%.

10. What is minimal QA Effect?

For those who expect to produce a quality plan with the minimum of investment, the following truisms should be borne in mind. Something is better than nothing. Concentrate efforts for greatest effect. Most major system failures have been caused by interface problems. Early error control

11. What is purpose of Quality Goals?

Quality goals for a software project or system. That probably makes one of the most important. Meaningful Quality goals are difficult to achieve agreement on, and then to establish, particularly in out area. The reason for this is that many of the people who have to be involved really have no understanding of the interplay required.

12. Name some Software Model in the industry?

ISO, CMM, IEEE etc.

13. What is the basic assumption behind the development of software?

The basic assumption behind the development of software is

- the single application are developed
- The requirements are fixed
- Resources is a major factor
- Lifetime of the system.

14. What is SDD?

A planned and Systematic pattern of all actions necessary to provide adequate confidence that the material, data, supplies and Services confirm to establish technical requirements and achieve satisfactory performance

15. Name the control tower in QA?

SQAP is the control tower in QA

16. Write some standards in QA?

They include

- ISO 9000
- IEEE STD 738
- CMM etc

17. Name any 2 software tools?

It includes modeling tools, browsers, test tools etc

18. Defining Archiving?

It contains the version control with the edition and the correction information of any product. The method of grouping or organizing the valuable facts in an instance is archiving.

19. What is non deliverable code?

It's the complete data collected which reflects the process performance like

- SQAP
- SQEP etc

20. Define Version control?

It contains the version control with the edition and the correction information of any product

Unit II

21. Define QA in ISO 9000?

QA minimal effort means the effort imparted in the practice of quality control. That follows any standards and conventions

22. Expand CMM?

Capability Maturity Model

23. Name any 2 ways that kill QA?

They are

- Backup procedures
- Document modules
- Media distribution

24. Expand PDCA?

PDCA stands for Plan Do Check Act the traditional way of software development process.

25. What is QAI?

QAI stands for Quality Assurance Institute that proposes a QAI-MODEL that is to be followed by all testing process to achieve world class testing.

26. Define Workbench?

Workbench is the diagrammatic representation of the activities and tasks that are carried out during a testing process by the testers. It is characterized by Input, Tasks and Output

27. What are the various Defects?

The various defects include Wrong, Missing, Variance, Extra etc.

28. State the Economics of Testing?

“Too much of testing is a crime, Too little testing is a sin”.

29. What is Job Shop?

Job Shop creates products of same type but with different characteristics. This is what normally done in software development.

30. Define Functional Testing?

Functional testing is also called White Box testing. This process of testing will test the functionality of the entities not the internal structure and logics of the entities.

31. Define Structural testing?

Structural testing is also called Black Box testing. This process of testing will test the internal structure and logics of the entities. This testing is supplemented by Unit testing.

32. Expand SDLC?

SDLC stands for Software Development Life cycle. This is a method for development of software products in a systematic and methodological manner.

33. Define SQA?

SQA stands for Software Quality Assurance. This is the measure of assuring the quality of the software products. The major activity done here is testing. The assurance process also follows the quality model called the QAI-MODEL.

34. Name any three criteria's in the QAI Model?

The criteria's are many they include Planning, Use of tools, Proper training etc.

35. Define Regression Testing?

Regression testing is another form of stress testing. This testing can also be done after the software has been deployed. Its mainly done for bug detection and error reporting.

36. What is the reality in Y2K?

The estimation is 1 or 2 dollars for each lines of code will be spend to fully correct both basic data field and resulting fields which include verification and testing also. The correction process is done using available tools and techniques.

37. Name the Programmer responsibilities of Y2K problems?

Moore law states that computing power increases by 48% per year. The power of programming languages increases every year by 11% but the programming skills of program increases by 4.8%.

38. Define CRC?
CRC Class Responsibility and Collaborators. It's a technique for identifying classes
39. What is the significance of SQAP?
SQAP defines roles and responsibilities of every individuals and organization.
40. Name some Version descriptions according to standards?
SDP, SQEP, SQAP, SCMP

Unit III

41. What is the significance of reviews and audit?
Reviews and audits are the assessing points in all the standards
42. Name two features in reviews?
Overview of software project reviews, Procedural description template, Action items, CMM and ISO compatibility
43. Name the four parts in Y2k lifecycle Model?
Inventory and analysis about system, plan task and remedies, Execute the plan (remedies), verify the plan
44. Name any three criteria's in the QAI Model?
The criteria's are many they include Planning, Use of tools, Proper training etc.
45. Name some staff associated with testing?
They include Developer, analyst, Tester, Mathematician, IT Management, CEO etc.
46. What is a test Checklist?
This checklist contains the questionnaire for conducting the tests. Each and every problem associated with the instance will be considered in the checklist.
47. What is the responsibility of the tools manager?
They are responsible for the selection of tool, purchase, training etc. They help in the implementation of the appropriate tool for the desired process. They keep track of the legacy tools also.

48. Name the software inspection procedures?
They are planning, overview, preparation, examination, rework and follow up.
49. What are the data collection requirements?
They are type, class, other classes and severity.
50. What are the special responsibilities in walkthrough objective?
They include moderator, recorder and author.
51. What are the review process prerequisites?
They include management, development staff, development process planning and review process planning.
52. Write the reliability activity goal?
To project software system readiness for acceptance, project reliability in operation and user confidence.
53. What are the hazard identification categories?
They are technical problems, product stability, acquisition difficulties, social impacts, economic impacts etc.
54. Name the KPA in level 2 and 4 of CMM?
Repeatable and managed.
55. Define the focus of CMM?
It focuses on system analysis of the system used to develop systems.
56. What is the strength of CMM?
It has very strong control over the auditors who are developed to issue a certification which has the appellation of CMM.
57. What is SPICE?
SEI CMM, ISO 9000, TickIt, Trillium, IEEE 1074
58. What are the categories of problems detected during the software operation?
It include software problem, documentation problem and design problem.
59. Where do problems in software come?
Requirements 50%, design 30% and coding 20%.
60. What are the inclusions in the audit output?
They include audit identification, scope, conclusions, synopsis and follow up.

Unit IV

61. What are the inclusions in the audit input?
They are purpose and scope of the audit, audit criteria, software elements and processes to be audited, background information.
62. What are the types of testing?
Unit, Integration, System Testing, Qualification and Acceptance.
63. What are the two types of Cost of Change?
Change Evaluation cost and change implementation cost are the two types of Cost of Change.
64. What is the purpose of CCB?
It provides both management and development with planned organizational structure specifically designed for controlling process of Change.
65. What are the steps involved in Corrective Action?
Conceptualize the problem
Requirements analysis and specification
Software architectural design and detailed design
Implementation and coding
Test – Unit , Integration, System
Installation and checkout
Operations and maintenance
66. What is methodology?
Methodologies are integrated sets of the tools and techniques. It is the description of the process which is to be used must be described or referenced.
67. What are the three position identification in Version Control?
Three position identification numbers are [Version].[Edition].[Correction]
68. What is involved in backup procedure?
The development library is backed up daily.
Project manager library is backed up weekly.
69. Give any four provision of control procedure.
- Project control of the design process
 - Sub-contracted and proprietary products.
 - Support and maintenance of the product.
 - Qualification approval of the project.
 - Use of tools.
 - The maintenance of tools and standards.

70. What is preventive maintenance?
A process of planned change to prevent failures from occurring
71. What is Testability?
The ability to perform an accepted series of tests on the system or product.
72. What are the analysis tools in Maintenance phase?
Statistical division of errors
The costs of errors
Evaluation of relative quality of the discovery
Error clustering analysis
Error typographical analysis
Ad hoc findings upon demand by management or by the customers
73. What are the data collection rules?
Data must be properly entered and stored
Data must be retained for the entire life cycle
Data must be backed up with a frequency not less than once per month.
74. What is software quality metric?
A function which inputs software data and outputs a single value interpretable as the degree to which software possesses an attribute that affects quality.
76. What are the headings under risk management document?
Description
Impact
Monitoring
Mitigation
75. What risk analysis report consists of?
Title page
Executive summary
Table of contents
Quality, Purpose and Scope
System Identification
Analysis Methodology
Hazard Identification results
76. What are the ISO 9000 Weakness?
Complexity, Repeatability, Inherent structure, Key audit factors and processes/Product Improvement.
77. What are the three main classifications of problems?
1. Software problem
2. Documentation problem

3. Design problem

78. What are the steps involved in change traceability?

- *Source code to “compiled” object code
- *Source documents in its derived documents

79. How to estimate the quality level of software?

Dividing the total number of defects discovered by the total number of characteristics and multiply that by 100 gives the quality level.

80. How to estimate degree of excellence?

Taking 100 and subtracting quality level gives the degree of excellence.

Unit V

81. What are the general purpose software engineering tasks includes in software in CMM compatibility?

Workstation, database management system, online helps aids, graphics tools, interactive documents and word processing.

82. What the types of distribution in Media control?

1. Distribution to internal project personnel
2. Distribution to external project personnel

83. What are the controls in Contractor plan?

1. Are the control described by the contractor plans used in development testing or all non deliverable software?
2. Are the define control as applied by plans?

84. Define quality metrics?

Quantitative measures of the degree to which the product possesses a given attributes that affects its quality.

85. What are the six axioms in Quality management?

1. The process of getting something done is a system
2. Quality is suitable of the product to retirements
3. Quality occurs when defects are prevented not from postmortem appraisal
4. There is only one performance goal
5. Manage by self delusion
6. Investment in quality do not cost

86. What are the four types of Quality evaluation reports?

1. Report of review results
2. Report of test results
3. Periodic reports
4. System survey reports

87. What is fault tree analysis?

Fault tree analysis is excellent tool for defining the problem concerned with the reliability of system.

88. What are the several of risk category?

1. Technical problem
2. Product stability
3. Acquistication difficulties
4. Social impacts
5. Ecnpomic impact
6. Failure impact.

89. What are the two ways in risk sorting procedure?

1. Level of danger
2. Probability of occurrence

90. What is the CMM Weakness?

1. Granularity
2. people/process/technology
3. CMM focus
4. Site comparison
5. Objective measurements.

91. What are the Structural testing methods?

- Feasibility review
- Requirements review
- Execution testing
- Recovery testing
- Operations testing
- Security testing

92. What are the Function testing methods?

- Unit testing
- Integrated testing
- System testing
- User acceptance testing
- Regression testing
- Error handling tests
- Manual support testing
- Inter system testing

93. What are the general conditions to look for while developing test data?

There are two conditions like tests of normally occurring transactions and tests using invalid data.

94. Name the persons responsible for conducting the design review?
They are the Project personal and the independent review team.
95. Name some guidelines to follow in design review process?
They are Select the review team, Train the review team members, Notify the project team etc.
96. What is High positive correlation?
The process is like take a situation analyze it by correlating with the older risks and success factors.
97. What is sampling?
The process like take a situation use sample criteria's to analyze the success from the whole sample.
98. What are the design phase deliverables?
They include Input specification, File specification, control specification, system specification etc.
99. What are the scoring tools?
They are the Project leader's assessment and Test team assessment.
100. What are the inclusions of a test data?
They are test factors, functions, platform and units.

Noorul Islam College of Engineering
Department of Software Engineering
II M.Sc SE (2Yrs)
Semester III

Descriptive Questions and Answers
Software Quality Assurance – MSE 231

Unit I

1. Explain in detail the fundamental requirements for any QA?

There are some fundamental requirements for any QA process to be successful. They includes,

- Assure the Quality of the S/W.

- The commitment of management to improve the process. (Corporate Culture).
- There should be always room or facility to improve the process.
- Preventing problems is better than reacting to them.
- There should be a management focus, leadership, participation.
- There should be a performance standard with no defects.
- There should be complete participation of the human resources.
- Focus of improvement should be on the process not the people.

2. Write notes on the Trillion Dollar Dilemma the Year 2000?

Trillion Dollar Dilemma the Year 2000: Y2k problem is also called as the millennium problem. It consists of the following parts:

- 1) Size
- 2) Prevalence
- 3) Complexity
- 4) Testability

Size

The problem of the size is not changing with new fields. The quantity of the fields is the Problem.

Prevalence

Attacks more no of Systems.

Complexity

All S/W needs to be corrected.

Testability

No Systems can be assumed reliable, (Even the Mainframe System) only when it is in a Testable mode.

3. Explain the Scope of Software Quality Process?

Scope of SQP: Requirement for Establishing and implementing the SQP includes the following:

- Planning and conducting assessments for the quality in S/W.
- Planning and conducting assessments for the quality of Documentation.
- Planning and conducting assessments for the quality of Workmanship.
- Planning and conducting assessments for the quality of all maintenance works.
- Planning and conducting assessments for the quality of deliverable and non deliverable items.

- Planning and conducting assessments for the quality of deliverable and non deliverables that are outcome.
- Planning and conducting assessments for the quality of planning items.
- Planning and conducting assessments for the quality of System boundaries.

4. Explain the Trillion Dollar Dilemma-The year 2000?

Year 2000 problem also called as Y2K problem or millennium problem or century problem or thousand year glitch. Y2k problem consists of four parts.

1. Size
2. Prevalence
3. Complexity
4. Testability

Size:

The problem of size is not changing with new fields. The quantity of the field is the problem

Prevalence:

This problem is prevailing to large amount of computers.

Complexity:

All software needs to be corrected

Testability:

No system can be assumed reliable only when the system in testable mode.

5. Y2k lifecycle Model:

It consists of four parts. They are

1. Inventory and analysis about system -25% of works
2. plan task and remedies -5% of works
3. Execute the plan(remedies) -20% - 30% of works
4. Verify the plan -40% - 50% of works

Certain reality in Y2K:

The estimation is 1 or 2 dollars for each lines of code will be spend to fully correct both basic data field and resulting fields which include verification and testing also. The correction process is done using available tools and

techniques. All errors must be corrected, tested and verified on a functionally equivalence basic with a operational or current system.

Programmer responsibilities of Y2K problems:

Moore law states that computing power increases by 48% per year. The power of programming languages increases every year by 11% but the programming skills of program increases by 4.8%.

6. Write the CMM and ISO compatibility of software development

The basic assumption behind the development of software is

1. the single application are developed
2. The requirements are fixed
3. Resources is a major factor
4. Lifetime of the system.

The ISO or CMM are providing the Guidelines about the address the problem of software maintenance.

We need balance between quality products and demands. The some of the limitations are

1. Too much to do
2. Too little time to do
3. Too few talents are involved to develop
4. Too many options.

7. Explain Management Information System:

Purpose is to supply management with information required to reach some polices and make plan. Without Strategic planning Management will be imposed with the opportunistic chances for Success. Budget and System Cost are very vital sources for planning and taking decisions.

Information in MIS should include rudimentary information about the production control, inventory and Scheduling. Also the software Development Process in Accordance with MIS.

8. Software Modeling and Commonly used Software Models:

Two Methods to select Software Model:

Model should address the subject or problem domain. The model should be widely accepted in the Market. Example. Waterfall Model, Spiral Model, IEEE Standards 730.

ISO 9000 discusses about the Quality Management. The CMM/SEI deals with the Process Management and Software functionality. IEEE 730 includes the standards based upon ISO and CMM.

Structure Of Model:

Any quality implementation process must include tools which can be used to evaluate the quality of the task being performed.

For this evaluation purpose we use various checklists, Worksheets, Forms etc. The major problem addressed is the fast and accurate collection of data which influences the process.

9. Continuous Process Improvement [CPI]:

The implementation of TQM in an Organization forces the Management to practice CPI. The concept of TQM is intended to guide the Quality Assurance Practitioner in Planning and Organizing the Software Quality produced by the Organization. Software Engineering is the iterative System.

TQM in Practice:

Major Products available in the Market have 90% of Software Context.

Steps in Planning for Quality:

An Organization in case in the Development, Acquisition, and Maintenance of Software must have the view of Quality and it must be related to the proposed product. Management relationship for Quality is advised.

10. Procedures for QA:

There are some fundamental requirements for any QA process to be successful. They includes,

- i) Assure the Quality of the S/W.
- ii) The commitment of management to improve the process. (Corporate Culture).
- iii) There should be always room or facility to improve the process.
- iv) Preventing problems is better than reacting to them.
- v) There should be a management focus, leadership, participation.
- vi) There should be a performance standard with no defects.

- vii) There should be complete participation of the human resources.
- viii) Focus of improvement should be on the process not the people.

Implement Quality Assurance Policy:

1. Establish a base type for Measurement.
2. We have to develop a comprehensive quality plan.
3. Implement the plan. It includes plan, Productivity, technology, quality etc.
4. Everything must include measurement.

11. Software Quality Program:

Effective establishment of quality Assurance program in an Organization is a complex process.

Two things associated with SQP:

- i) A fast and accurate collection of data, those data must reflect how the SDLC will be carried out.
- ii) To develop a quality plan

Requirement for Establishing and implementing the SQP includes the following:

- i) Planning and conducting assessments for the quality in S/W.
- ii) Planning and conducting assessments for the quality of Documentation.
- iii) Planning and conducting assessments for the quality of Workmanship.
- iv) Planning and conducting assessments for the quality of all maintenance works.
- v) Planning and conducting assessments for the quality of deliverable and non deliverable items.
- vi) Planning and conducting assessments for the quality of deliverable and non deliverables that are outcome.
- vii) Planning and conducting assessments for the quality of planning items.
- viii) Planning and conducting assessments for the quality of System boundaries.

12. SQA Effort:

Something is better than nothing. Corporate your efforts for things with greatest effect. Concentrate on interface problems. Practice early error control.

Search for critical and risky functions. Never indulge more in developing new tools or methods. Encourage developers' cooperation.

Quality Plan:

There are 3 barriers with management in assuring a Quality Plan.

- i) The management should understand the direct relationship between improved quality and productivity.
- ii) The management must understand the system and sub system that determines the performance.
- iii) Lack of Understandability of the management regarding their role in Quality Assurance.

13. Technical Definition of SQP:

The S/W Quality process consists of 3 parts.

- 1) Requirements
- 2) Confidence
- 3) Constant improvement

Requirements

Organization must develop, manufacture and distribute low cost products and services in a consistent manner.

Confidence

Products must be supplied as the client needs in his acceptable level of reliability.

Constant improvement

In order that the client should rely on the supplier the producer must produce with a constant improvement as an integral part of the Corporate Culture.

14. Explain the tools, techniques and methodologies describe items that support quality assurance functions?

The tools, techniques and methodologies describe items that support quality assurance functions. They may be software supported.

- Tools aid in evaluation and improvement of quality.
- They include software and hardware tools.
- The techniques contain both managerial and technical procedures that help evaluate the quality.
- Preventing problems is better than reacting to them.
- The RVTM is made use off by the practitioners.
- CMM compatibility is included in the Level 2.
- Paragraph 4.4 of ISO 9001 emphasizes these tools.

- All tools must be validated for the tasks that they need to perform.

15. Explain Code control?

Code control describes items that support quality assurance functions and methods for recording and controlling changes to software.

- The logic behind code control is the final assembly
- More time is spent on maintenance rather than development of the products.
- It explains about the version control with the edition, correction values.
- The archiving of the related information's are recommended.
- Great care must be taken in the collection of non deliverable code.
- Level 2 of CMM provides the standard recommendations for the code control
- ISO 9001, paragraph 6.1 is compatible with the code control.

16. What are the SQAP defines roles and responsibilities?

SQAP defines roles and responsibilities of every individuals and Organization. Requirement for Establishing and implementing the SQAP includes the following:

- Senior management and even board of directors should have quality responsibilities.
- It is the quality system that must take the responsibility for the level of workmanship.
- If there is a major failure the person responsible must do the post-mortem.
- The software products include the following.
- SSS, SSDD, SRS, TLD, DD, IRS, IDD, SPS.
- Acquisition of the QA support tools..
- Final quality of product must be evaluated.
- Factors affecting the SQA effort, fundamental requirements.

17. Business perspective of testing includes

- Revising the testing process
- Assurance with the QAI – Model
- Budget estimation of the testing
- Preparation of world class testing process
- Testing as an organizational issue
- Test outsourcing process
- Hiring of the testers

- The persons associated with Testing are
- Software User
- Software developer
- System analyst
- IT Management
- CEO
- Auditor

18. Structured approach for Testing include the following

- Starting with a neat testing plan
- Plan should contain Test strategy, test policy, test methodology etc
- Perform or practice V testing
- V testing is called Verification Validation testing
- Prepare test matrix or tactical cube
- Conduct requirements review
- Perform Feasibility study
- Perform Structural and functional testing
- Unit and stress testing must be conducted in every phases of development

19. Write the Economics of Testing using the Test Cost Curve?

- Economics of Testing using the Test Cost Curve is
- Too little testing is a sin and Too much testing is a crime
- Novice errors are 30 per 1000 lines of code
- Proper testing makes it 1 error per 30000 lines of code
- The test cost curve is mapped against the cost of testing and the extent of testing.
- Cost of errors in different phases will have its own impacts
- As the phase progresses with errors the budget will increase.

20. Explain Requirements for testing in detail?

- The inputs include Project requirements
- Requirements gathering process
- The step consists of three tasks
- Preparing the risk matrix
- Test factor analysis based on the test policy
- Conducting requirements walkthrough
- Check procedure is to check for correctness and completeness of the work
- Rework is done if necessary
- The deliverable is a test report
- Guideline must also be prepared

21. What are Test Strategies?

- Developing a Test Strategy
- Strategies are minimally three like
- Testing After the development is completed
- Testing at different phases of development
- Testing along with the development
- Test strategy includes the following
- Test factor and test phases
- Factors are many like Authorization
- Compliance, correctness etc
- A graph called the test matrix can be prepared to explain the extent of testing