SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF INFORMATION TECHNOLOGY

Common to,

Department of Artificial Intelligence and Data Science
Department of Computer Science and Engineering

QUESTION BANK

VII SEMESTER

1908003–SOFTWARE QUALITY MANAGEMENT

Regulation – 2019

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Open Elective II

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DEPARTMENT OF IT, AI&DS & CSE

QUESTION BANK

SUBJECT : SOFTWARE QULAITY MANAGEMENT

SEM / YEAR : VII Sem / IV Year

UNIT I - Introduction To Software Quality

Software Quality – Hierarchical models of Boehm and McCall – Quality measurement – Metrics measurement and analysis – Gilb's approach – GQM Model

PART – A

Q.No	Questions	BT Level	Competence
1.	What is quality?	BTL 1	Remembering
2.	Tell the insights of quality.	BTL 1	Remembering
3.	Recall the definition of quality proved by ISO.	BTL 1	Remembering
4.	List out the reasons which make computer software problematical.	BTL 1	Remembering
5.	Give the roles of stakeholders in software Development.	BTL 2	Understanding
6.	Interpret the conflicting views of Users and Designer.	BTL 2	Understanding
7.	Point out the five different views of quality.	BTL 2	Understanding
8.	Give the schematic hierarchical view of software quality.	BTL 2	Understanding
9.	What are the matrices associated with reliability.	BTL 1	Remembering
10.	List the three areas addressed by McCall's model.	BTL 1	Remembering
11.	What is the difference between reliability and Integrity.	BTL 1	Remembering
12.	Compare and contrast Predictive metrics and Descriptive metrics.	BTL 2	Understanding
13.	Outline the seven criteria for a good metric.	BTL 2	Understanding
14.	Interpret Mean Time to Failure and give the formula for MTTF.	BTL 2	Understanding
15.	Demonstrate the problem with metrics.	BTL 2	Understanding
16.	Compare and contrast simple scoring and weighted scoring.	BTL 2	Understanding
17.	Illustrate polarity profiling.	BTL 2	Understanding
18.	List the Gilb's attributes and sub attributes.	BTL 1	Remembering
19.	Infer and highlight the Dickson's classification of reliability criteria.	BTL 2	Understanding
20.	List the resource attributes highlighted byGilb	BTL 1	Remembering
21.	Relate your understanding of Transcendent Properties.	BTL 1	Remembering
22.	Tell the need for quality metrics.	BTL 1	Remembering
23.	Find out the need of GQM Model	BTL 1	Remembering
24.	Summarize an overview of three levels in GQM.	BTL 2	Understanding

PART-B

1.	Give a brief account on the five different methods for measuring the overall quality of the system as mentioned by Watts.(13)	BTL 4	Analyzing
2.	Mention the classification of software metric. What makes a good metric?Analyze the different types of matrices based on the fundamental property on which they depend. (13)	BTL 4	Analyzing
3.	Analyze Gilbs Quality attributes with suitable example. (13)	BTL 4	Analyzing

4.	Develop an overview about Product Quality Metrics. (13)	BTL 3	Applying
5.	Discover the need of Function Point in Quality assessment and explain the five major components and characteristics which play a major role in calculation of FP? (13)	BTL 4	Analyzing
6.	Identify and experiment in detail the different views of quality. (13)	BTL 3	Applying
7.	Give an account on Polarity profiling with suitable example of your own. (13)	BTL 4	Analyzing
8.	Analyze about the schematic hierarchical model of quality based on practical studies. (13)	BTL 4	Analyzing
9.	Name and examine in detail any two models which you have studied to predict the quality of any software. (13)	BTL 4	Analyzing
10.	Identify the COQUAMO tools used for monitoring the quality of the product with suitable diagram and give an overview it. (13)	BTL 3	Applying
11.	Experiment in detail about In Process Quality Metrics and its importance in measuring the software quality. (13)	BTL 3	Applying
12.	Examine the McCall's quality model and assess the McCall's quality criteria with suitable example. (13)	BTL 4	Analyzing
13.	(i) Give an account on problem with metrics. (7) (ii) Analyze Polority profiling with suitable example. (6)	BTL 4	Analyzing
14.	(i) Identify the Dicksons classification of reliability criteria. (7) (ii)Choose and analyze any two quality attributes highlighted by Gilb. (6)	BTL 3	Applying
15.	Assess the behavior of Bohem Model and show the relationship between various criteria. (13)	BTL 5	Evaluating
16.	Evaluate the Goal Question Metric approach in software quality with suitable example. (13)	BTL 5	Evaluating
17.	With relevant example of your choice show how quality can be measured using different metrics. (13)	BTL 6	Creating

PART – C

1.	Compare and contrast the hierarchical models of Boehm and Mccall's. (15)	BTL 5	Evaluating
2.	Using the following data and phased weighting factor ,calculate the following (5+5+5) a. Product Operation Weighted Mean b. Product Transition Weighted Mean c. Overall measure by PWF method.	BTL 5	Evaluating
3.	Garvin's five view are not intended as exhaustive. What are the other views of quality might one consider. Discuss(15)	BTL 6	Creating
4.	How far does Perry's analysis of relationships tally with your own experience of computer systems? Has it been over taken by advances in technology? (15)	BTL 6	Creating
5.	Show how the Goal/Question/Metric (GQM) method is a proven technique used for goal oriented measure with a suitable example. (15)	BTL 6	Creating

GROUP	CRITERIA	METRIC	WEIGHT	PWF
Proudct Operation	Usablity	0.7	0.5	2/3
	Security	0.5	0.5	
	Efficiency	0.6	0.2	
	Correctness	0.7	0.5	
	Reliability	0.4	0.4	
Product Transition	Maintainability	0.8	0.4	1/3
	Adaptability	0.7	0.1	
	Expandability	0.7	0.1	

UNIT II - Software Quality Assurance			
Quality tasks – SQA plan – Teams – Characteristics – Implementation – Documentation – Reviews and Audits			
PART – A			
Q.No	**Questions**	**BT Level**	**Competence**
1.	What are Quality tasks?	BTL 1	Remembering
2.	Define Software Quality Assurance.	BTL 1	Remembering
3.	List out the teams and their responsibilities.	BTL 1	Remembering
4.	Recall the special responsibilities of Technical Review Process.	BTL 1	Remembering
5.	Compare and contrast review and audit.	BTL 2	Understanding
6.	What makes Quality assurance work minimal?	BTL 1	Remembering
7.	Infer the need of SQA plan.	BTL 2	Understanding
8.	Interpret the ways of killing Quality Assurance.	BTL 2	Understanding
9.	Demonstrate the role of software Inspection.	BTL 2	Understanding
10.	Where SQA is used?	BTL 1	Remembering
11.	Infer the factors affecting SQA effort.	BTL 2	Understanding
12.	Summarize the elements of documentation.	BTL 2	Understanding
13.	llustrate about SSD.	BTL 2	Understanding
14.	Show the Documents Documentation plan worksheet	BTL 2	Understanding
15.	List the seven keys to leadership.	BTL 1	Remembering
16.	Tell the characteristics of Quality Assurance.	BTL 1	Remembering
17.	Illustrate the steps in Document distribution.	BTL 2	Understanding
18.	Tell about SRS and its importance.	BTL 1	Remembering
19.	Interpret the steps in audit process.	BTL 2	Understanding
20.	What are the components of quality assurance plan?	BTL 2	Understanding
21.	Outline the need of Walkthrough.	BTL 2	Understanding
22.	Recall the Reviewing description template	BTL 1	Remembering
23	Give the importance of Document verification.	BTL 1	Remembering
24.	Outline about the need of action items.	BTL 2	Understanding
PART – B			
1.	Identify the role of Procedural description template and Action items. (13)	BTL 3	Applying
2.	Discover the objective and goal of a SQA Plan? Experiment it with a suitable example. (13)	BTL 4	Analyzing
3.	Construct how will you establish quality goals? Explain it. (13)	BTL 3	Applying
4.	Analyze the different types of Team structure. (13)	BTL 4	Analyzing
5.	Examine in detail the Quality tasks and responsibilities. (13)	BTL 4	Analyzing
6.	Analyze the management review process. (13)	BTL 4	Analyzing
7.	Examine in detail about the Documentation. (13)	BTL 3	Applying
8.	Examine in detail the CMM Compatibility of Reviews and audits. (13)	BTL 4	Analyzing
9.	Experiment the candidate work products for review? Schematically organize and show the review process model with proper justification. (13)	BTL 3	Applying
10.	(i) Identify the roles and responsibilities of a SQA team. (7)	BTL 3	Applying

	(ii) Organize the work products that will be reviewed and audited by a SQA auditor. (6)		
11.	Illustrate the Technical Review process in detail. (13)	BTL 3	Applying
12.	(i)Analyze the similarity and dissimilarity in document verification and validation. (7) (ii) Discover the factors affecting SQA effort. (6)	BTL 4	Analyzing
13.	Examine the need of software inspection process in determining the quality of a software product. (13)	BTL 4	Analyzing
14.	Identify the need and importance of audit process. (13)	BTL 3	Applying
15.	Determine the steps and importance of technical review process. (13)	BTL 5	Evaluating
16.	Evaluate the importance of walkthrough and justify why it is needed in quality evaluation. (13)	BTL 5	Evaluating
17.	Discuss about the types of review. (13)	BTL 6	Creating
PART – C			
1.	For removing bugs from code,would review or testing be more effective.Evaluate the reason behind your answer. (15)	BTL 5	Evaluating
2.	Explain the following a. Document verification. (8) b. The Audit process (7)	BTL 5	Evaluating
3.	Create your own example to show why Quality Assurance plan is important for software companies. (15)	BTL 6	Creating
4.	Formulate the best practices to be followed while creating a SQA plan. (15)	BTL 6	Creating
5.	Elaborate on the key aspects that an QA team should focus on to prepare an SQA plan. (15)	BTL 6	Creating

UNIT III – Quality Control and Reliability			
Tools for Quality- Ishikawa's basic Tools – CASE Tools – Defect Prevention and Removal – Reliability Models – Rayleigh model – Reliability growth models for quality Assessment			
PART – A			
Q.No	**Questions**	**BT Level**	**Competence**
1.	List out the basic Quality Tools available in Software Development.	BTL 1	Remembering
2.	Write short notes on pareto diagram	BTL 1	Remembering
3.	Write short notes on histogram.	BTL 1	Remembering
4.	Write short notes on checklist.	BTL 1	Remembering
5.	What is Run Charts?	BTL 1	Remembering
6.	List the purpose of Cause and Effect Diagram.	BTL 1	Remembering
7.	How to find error detection efficiency?	BTL 1	Remembering
8.	How to find Early Detection Percentage?	BTL 1	Remembering
9.	Define Ishikawa's basic tools for quality assessment.	BTL 1	Remembering
10.	Define Software reliability model.	BTL 1	Remembering
11.	Write the formula for CDF.	BTL 1	Remembering
12.	Write the formula for PDF.	BTL 1	Remembering
13.	Define Reliability growth models.	BTL 1	Remembering
14.	Write short notes on Littlewood Models.	BTL 1	Remembering
15.	List the criteria for model Evaluation.	BTL 1	Remembering
16.	Define Rayleigh model.	BTL 1	Remembering
17.	Draw the cause and effect Diagram for software Development.	BTL 2	Understanding

18.	Draw the Fishbone Diagram for software Development.	BTL 2	Understanding
19.	What is DPP?	BTL 1	Remembering
20.	Why is software testing essential in defect prevention?	BTL 2	Understanding
21.	What is CMM?	BTL 1	Remembering
22.	Define Phase Based Defect Removal Model.	BTL 1	Remembering
23	What is Failure Rate (FR)?	BTL 1	Remembering
24.	Write notes on the delayed S and Inflection S models.	BTL 1	Remembering
PART – B			
1.	Discuss in detail about Pareto diagram and Histogram. (13)	BTL 6	Creating
2.	Discuss in detail about check list and Run charts. (13)	BTL 6	Creating
3.	Explain in details about cause and effect diagram. (13)	BTL 5	Evaluating
4.	Discuss in detail about error detection. (13)	BTL 6	Creating
5.	Explain the process of defect prevention in software development. Provide examples.	BTL 6	Creating
6.	How can a Histogram be used to analyze the distribution of process data and identify areas for improvement? (13)	BTL 5	Evaluating
7.	Explain about Software Relaibility Model. (13)	BTL 5	Evaluating
8.	Discuss in detail about CDF and PDF. (13)	BTL 6	Creating
9.	Discuss about Reliability growth models. (13)	BTL 6	Creating
10.	Discuss about the Littlewoods model with suitable diagram. (13)	BTL 5	Evaluating
11.	Explain about Rayleigh model. (13)	BTL 5	Evaluating
12.	Discuss in detail about Defect prevention. (13)	BTL 6	Creating
13.	Describe about quality Assessment. (13)	BTL 3	Applying
14.	Discuss in detail about the benefits of Reliability growth model. (13)	BTL 6	Creating
15.	Discover the defects prevention activities in detail. (13)	BTL 4	Analyzing
16.	Discuss the challenges and benefits of implementing a defect prevention program in an organization. (13)	BTL 6	Creating
17.	Determine the Characteristics of a Successful CASE Tool in detail. (13)	BTL 5	Evaluating
PART – C			
1.	Explain the basic quality tools available in software development. (15)	BTL 5	Evaluating
2.	Discuss in details about CASE Tools. (15)	BTL 6	Creating
3.	Discuss the Ishikawa's basic Tools with suitable diagram. (15)	BTL 6	Creating
4.	Elaborate the Traditional development SDLC vs Case Tool assisted SDLC with suitable example. (15)	BTL 5	Evaluating
5.	Evaluate and compare the various models available in defect prevention. (15)	BTL 5	Evaluating

UNIT-IV – Quality Management System			
Elements of QMS – Rayleigh model framework – Reliability Growth models for QMS – Complexity metrics and Models – Customer Satisfaction Analysis.			
PART – A			
Q.No	**Questions**	**BT Level**	**Competence**
1.	What is the role of quality planning in a QMS?	BTL 1	Remembering
2.	Define quality assurance and give an example.	BTL 1	Remembering
3.	Why is documentation important in a QMS?	BTL 1	Remembering
4.	Briefly give key note on the concept of continuous improvement in a	BTL 2	Understanding

	QMS.		
5.	Name two key components of a Quality Management System (QMS).	BTL 2	Understanding
6.	Outline the stages of the Rayleigh model for continuous improvement.	BTL 2	Understanding
7.	What metrics are used to measure the effectiveness of the Rayleigh model?	BTL 1	Remembering
8.	What is Rayleigh model?	BTL 1	Remembering
9.	What is the purpose of reliability growth models in software quality management?	BTL 1	Remembering
10.	Mention the steps involved in implementing a reliability growth program.	BTL 2	Understanding
11.	What are the benefits of using the Crow-AMSAA model in reliability growth?.	BTL 1	Remembering
12.	Define Cyclomatic Complexity and its significance.	BTL 1	Remembering
13.	Name a complexity metric that measures software size and complexity.	BTL 2	Understanding
14.	Write the formula for cyclomatic complexity.	BTL 1	Remembering
15.	List the advantages of cyclomatic complexity.	BTL 2	Understanding
16.	What is Functional Point Analysis (FPA) ?	BTL 1	Remembering
17.	Why is customer satisfaction analysis important in software quality management?	BTL 1	Remembering
18.	Outline the challenges in implementing the Rayleigh Model framework.	BTL 2	Understanding
19.	How can customer feedback be effectively analyzed in QMS?	BTL 2	Understanding
20.	Compare and contrast Quality Assurance and Quality Control in QMS.	BTL 2	Understanding
21.	Why is it important for QMS to focus on customer satisfaction?	BTL 1	Remembering
22.	How do complexity models help in QMS?	BTL 2	Understanding
23	What are complexity metrics used to measure?	BTL 1	Remembering
24.	List two methods used for gathering customer feedback in QMS.	BTL 2	Understanding
	PART – B		
1.	Critically analyze the role of Quality Planning in achieving organizational objectives within QMS. (13)	BTL 4	Analyzing
2.	Evaluate the effectiveness of reliability growth models in predicting and managing product reliability improvements in QMS. (13)	BTL 5	Evaluating
3.	Explain how complexity metrics and models contribute to managing system complexity in QMS. (13)	BTL 4	Analyzing
4.	Compare and contrast different reliability growth models used in QMS, highlighting their advantages and limitations. (13)	BTL 4	Analyzing
5.	Assess the impact of complexity on QMS processes and outcomes, with suitable examples. (13)	BTL 4	Analyzing
6.	Analyze the importance of customer satisfaction analysis in ensuring the success of QMS initiatives. (13)	BTL 4	Analyzing
7.	Evaluate the challenges and benefits of implementing the Rayleigh model framework in QMS practices. (13)	BTL 5	Evaluating
8.	Discuss the methods and techniques used for measuring and improving customer satisfaction in QMS. (13)	BTL 4	Analyzing
9.	Critically examine the relationship between quality control measures and continuous improvement in QMS. (13)	BTL 5	Evaluating
10.	Assess the role of reliability growth models in enhancing product quality and reliability in QMS. (13)	BTL 4	Analyzing
11.	Explain how complexity metrics can be integrated into QMS to manage and mitigate risks associated with system complexity. (13)	BTL 4	Analyzing
12.	Discuss the ethical considerations involved in conducting customer satisfaction analysis in QMS. (13)	BTL 4	Analyzing
13.	Evaluate the impact of complexity metrics on decision-making	BTL 5	Evaluating

	processes within QMS. (13)		
14.	Compare the advantages and disadvantages of using different customer feedback mechanisms in QMS. (13)	BTL 4	Analyzing
15.	Critically evaluate the relevance of the Rayleigh Model framework in modern QMS practices. (13)	BTL 5	Evaluating
16.	Discuss the implications of system complexity on the overall quality management strategy in QMS. (13)	BTL 4	Analyzing
17.	Evaluate the effectiveness of reliability growth models in addressing customer satisfaction issues in QMS. (13)	BTL 5	Evaluating
PART – C			
1.	What are the essential elements of quality management system and discuss in detail. (15)	BTL 6	Creating
2.	Discuss in detail about the reliability growth models with suitable example. (15)	BTL 6	Creating
3.	Discuss the principles and components of the Rayleigh Model framework and their application in software quality management. (15)	BTL 5	Evaluating
4.	Analyze the factors influencing the choice of reliability growth models in different stages of product development within QMS. (15)	BTL 5	Evaluating
5.	Discuss the challenges and opportunities associated with implementing continuous improvement strategies in QMS. (15)	BTL 5	Evaluating

UNIT V - Quality Standards			
Need for statements – ISO 9000 Series – ISO 9000-3 for Software development - CMM and CMMI – Six Sigma Concepts			
PART – A			
Q.No	**Questions**	**BT Level**	**Competence**
1.	What is the purpose of the ISO 9000 Series?	BTL 1	Remembering
2.	Define ISO 9001 and its primary focus.	BTL 1	Remembering
3.	Distinguish bettween ISO 9000 and ISO 9001.	BTL 2	Understanding
4.	List two benefits of ISO 9000 certification for organizations.	BTL 2	Understanding
5.	What is ISO 9000-3 and its relevance to software development?	BTL 1	Remembering
6.	Name two key principles of ISO 9000-3.	BTL 2	Understanding
7.	Define CMM (Capability Maturity Model).	BTL 1	Remembering
8.	List two key process areas in CMM.	BTL 2	Understanding
9.	What is the difference between CMM and CMMI?	BTL 1	Remembering
10.	Define CMMI (Capability Maturity Model Integration).	BTL 1	Remembering
11.	List two improvements introduced by CMMI over CMM.	BTL 2	Understanding
12.	Define Six Sigma.	BTL 1	Remembering
13.	List two methodologies used in Six Sigma.	BTL 2	Understanding
14.	What is DMAIC in Six Sigma?	BTL 1	Remembering
15.	Define DFSS (Design for Six Sigma).	BTL 1	Remembering
16.	Outline the concept of "Process Capability" in Six Sigma.	BTL 2	Understanding
17.	What is the role of statistical analysis in Six Sigma?	BTL 1	Remembering
18.	Define Lean Six Sigma.	BTL 1	Remembering
19.	List two benefits of implementing Six Sigma in an organization.	BTL 2	Understanding
20.	What is the importance of data-driven decision-making in Six Sigma?	BTL 1	Remembering
21.	Define ISO 9000-3 in the context of software quality management.	BTL 1	Remembering
22.	List two process improvement models used in CMM.	BTL 2	Understanding
23	How does CMMI address the limitations of CMM?	BTL 1	Remembering
24.	Illustrate the role of customer focus in ISO 9000.	BTL 2	Understanding

PART – B			
1.	Compare and contrast ISO 9000 and ISO 9001 standards, discussing their significance in quality management systems. (13)	BTL 4	Analyzing
2.	Critically analyze the implementation challenges of ISO 9000-3 in software development projects. (13)	BTL 5	Evaluating
3.	Evaluate the evolution of CMM from its initial stages to CMMI, emphasizing the improvements and benefits introduced. (13)	BTL 4	Analyzing
4.	Discuss the key principles and benefits of CMMI adoption in enhancing organizational processes and quality. (13)	BTL 4	Analyzing
5.	Assess the role of maturity levels in the CMM framework and their impact on organizational performance. (13)	BTL 4	Analyzing
6.	Analyze the integration of Lean principles into Six Sigma methodologies, highlighting their combined benefits in quality management. (13)	BTL 4	Analyzing
7.	Evaluate the importance of statistical tools and techniques in SixSigma methodologies for process improvement. (13)	BTL 4	Analyzing
8.	Discuss the DMAIC methodology in Six Sigma and its application in improving organizational processes. (13)	BTL 4	Analyzing
9.	Critically examine the challenges faced by organizations in implementing Six Sigma and strategies to overcome them. (13)	BTL 5	Evaluating
10.	Evaluate the role of leadership in driving successful implementation of six Sigma initiatives within an organization. (13)	BTL 5	Evaluating
11.	Analyze the impact of DFSS on product development and its alignment with overall business goals in Six Sigma. (13)	BTL 4	Analyzing
12.	Discuss the benefits and challenges of adopting a customer-focused approach in ISO 9000 standards. (13)	BTL 4	Analyzing
13.	Evaluate the effectiveness of ISO 9000-3 guidelines in improving software quality and customer satisfaction. (13)	BTL 5	Evaluating
14.	Compare the benefits of ISO 9000-3 versus other software quality standards in the industry. (13)	BTL 4	Analyzing
15.	Evaluate the ethical considerations involved in implementing Six Sigma practices in an organization. (13)	BTL 5	Evaluating
16.	Analyze the role of metrics and measurement in assessing organizational maturity levels under the CMMI framework. (13)	BTL 4	Analyzing
17.	Evaluate the impact of CMMI maturity levels on organizational culture and continuous improvement efforts. (13)	BTL 5	Evaluating
PART – C			
1.	Compare and contrast ISO 9000 and ISO 9001 standards, discussing their significance in quality management systems. (15)	BTL 5	Evaluating
2.	Explain in details about CMM . (15)	BTL 5	Evaluating
3.	Critically examine the application of Lean Six Sigma in reducing operational inefficiencies and improving customer satisfaction. (15)	BTL 6	Creating
4.	Discuss the evolution of Six Sigma from a quality management tool to a broader business strategy for organizational excellence. (15)	BTL 6	Creating
5.	Discuss in detail about six sigma concepts. (15)	BTL 6	Creating


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