Paper ID:44606 **L T/P C**

Code: IT606 **Paper: Software Testing and Quality Assurance** **3 1 4**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks: 75**
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

Course Outcomes:

CO 1	Understanding software quality, quality factors and standards.
CO 2	Understanding the software testing fundamentals, testing process and different verification methods.
CO 3	Ability to use the software validation techniques.
CO 4	Ability to use the agile based testing and automated testing tools.

Course Outcomes -Program Outcomes Matrix

Filled on a scale of 1 to 3 (3=High; 2=Moderate; 1=Low; '-'for no correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3	3	3	2	2	2	2	2	2	2
CO 2	3	3	3	3	3	2	2	3	2	2	2	2
CO 3	3	3	3	3	3	2	2	3	2	2	2	2
CO 4	3	3	3	3	3	2	2	3	3	2	2	2

UNIT 1

What is software quality, Expectations and Challenges, Software Quality Factors, Components of Software Quality Assurance System, Quality Metrics, Costs of Software Quality, Quality Management Standards, SQA unit and other actors in SQA system, Quality standards: ISO-9000, CMM, Six Sigma, Software Quality, Bad Smells in the code, Refactoring and its effects on software quality

Fundaments of software testing, The psychology of testing, testing throughout software life cycle, Terminologies: Error, Fault, Failure, Incident, Test Cases, Test Suite, Deliverables and Milestones, Software Testing Process, Developing the Test Plan, Verification, validation, Alpha, Beta and Acceptance Testing

UNIT 2

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause-Effect Graphing Technique

Structural Testing: Control Flow Testing, Statement Coverage Branch Coverage Condition Coverage Path Coverage, Data Flow Testing, DU path, DC path, Slice Based Testing, Mutation Testing

UNIT 3

Regression Testing: Selection, Minimization and Prioritization of Test Cases for Regression Testing,Regression Testing Process,Selection of Test Cases,Regression Test Cases Selection,Reducing The Number of Test Cases,Minimization of Test Cases,Prioritization of Test Cases

Agile Testing: What is Agile Testing? Challenges, testing quadrants, creating user stories, test scenarios and test cases. Agile test automation strategy and tool (selenium) for automation

UNIT 4

Software Metrics,Characteristics of Software Metrics,Measurement Basics,Product and Process Metrics,Measurement Scale,Measuring Size,Measuring Software QualitySoftware, Quality Metrics Based on Defects,Defect Density,Phase-Based Defect Density,Defect Removal Effectiveness,Usability Metrics,Testing Metrics,OO Metrics, Some Popular OO Metric Suites,Dynamic Software Metric

Tool support for Testing, Selecting and Installing Software Testing tools. Automation and

Testing Tools - Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMeter, JUNIT, Selenium, and Cactus.

Text Books:

1. Daniel Galin, "Software Quality Assurance – From Theory to Implementation", Addison Wesley, Pearson Education, 2003
2. Yogesh, Singh, "Software Testing", Cambridge University Press, 2011
3. Ruchika Malhotra, Empirical Research in Software Engineering: Concepts, Analysis and Applications, CRC press, 2016

References Books:

1. William E. Perry, "Effective Methods for Software Testing", Third edition, Wiley, 2006
2. RenuRajni, Pradeep Oak, "Software Testing: Effective Methods, Tools and Techniques", McGraw Hill Education, 2004.
3. Rahul Shedye, "Software Automation Testing Tools for Beginners", Shroff Publishers, 2012.
4. K.V.K.K. Prasad, "Software Testing Tools", DreamTech Press, 2008
5. Nageswara Rao Pusuluri, "Software Testing Concepts and Tools", DreamTech Press, 2007.
6. Robert Dunn, "Software Quality Concepts and Plans", Prentice-Hall, 2003.
7. Alan Gillies, "Software Quality, Theory and Management", Chapman and Hall, 2004.
8. Naresh Chauhan, "Software Testing – Principles and Practices", Oxford University Press, 2010.
9. Jeannine M. Siviy, M. Lynn Penn, obert W. Stoddard, "CMMI and Six Sigma: Partners in Process Improvement", Pearson Education, 2007.
10. Rex Black, Erik Van Veenendaal, Dorothy Graham, "Foundation of Software Testing", ISTQB Certi fication, third Edition, Cenage learning, 2015
11. John W. Horch, "Practical Guide to Software Quality Management", second edition, Artech House, London, 2003