



**B.E DEGREE EXAMINATIONS: APRIL 2018**  
(Regulation 2014)  
Eighth Semester  
**COMPUTER SCIENCE AND ENGINEERING**  
U14CSTE83 : Software Quality Assurance and Testing

**COURSE OUTCOMES**

- CO1:** Outline software testing methods  
**CO2:** Summarize risk in software project development.  
**CO3:** Develop knowledge in understanding the importance of Software Quality Assurance.  
**CO4:** Utilize the appropriate testing techniques for information systems development.  
**CO5:** Apply the metrics involved in software development.

**Time: Three Hours****Maximum Marks: 100**

**Answer all the Questions:-**  
**PART A (10 x 1 = 10 Marks)**

1. Matching type item with multiple choice code

CO1 [K<sub>2</sub>]

List I	List II
A. Functional testing	i. Missing Statements
B. Statement Coverage	ii. Maintenance testing
C. Code Coverage	iii. boundary value analysis
D. Impact Analysis	iv. Test Effectiveness

- |    | A   | B  | C   | D  |
|----|-----|----|-----|----|
| a) | ii  | i  | iii | iv |
| b) | iii | i  | iv  | ii |
| c) | ii  | iv | iii | i  |
| d) | iii | i  | ii  | iv |

2. A retail company purchased commercial off the shelf application for automating their billing process. But before introducing it on large scale they are going for beta testing .What will be the reason for doing this?

CO4 [K<sub>3</sub>]

- |                       |                                 |
|-----------------------|---------------------------------|
| a) To find defects    | b) To gain confidence in system |
| c) To train employees | d) All of the above             |

3. Which of the following are not white box testing techniques?

CO4 [K<sub>1</sub>]

- Statement testing and coverage
- Decision testing and coverage
- Boundary analysis
- Equivalence Class Partitioning.

- |        |        |
|--------|--------|
| a) 3,4 | b) 1,4 |
| c) 1,2 | d) 2,3 |

4. White box testing can be started CO4 [K<sub>1</sub>]  
 a) After SRS creation b) After designing  
 c) After coding d) After maintenance
5. Assertion (A): DRE gives a measure of the development team ability to remove defects prior to release. CO5 [K<sub>2</sub>]  
 Reason (R): DRE is calculated as a ratio of defects resolved to total number of defects found  
 a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A  
 c) A is true but R is false d) A is false but R is true
6. Which of the following provide useful measures of software quality? CO3 [K<sub>2</sub>]  
 a) correctness, business relevance, integrity, usability b) correctness, maintainability, integrity, usability  
 c) reliability, maintainability, integrity, sales d) correctness, maintainability, size, satisfaction
7. What is the order in which test levels are performed? CO1 [K<sub>1</sub>]  
 1) Unit, Integration, System, Acceptance  
 2) Unit ,System, Integration, Acceptance  
 3) Unit, Integration, Acceptance, System  
 4) It depends on nature of a project.  
 a) 2-3-4-1 b) 1-3-2-4  
 c) 3-4-2-1 d) 4-1-3-2
8. Which of the following characterizes the cost of faults? CO2 [K<sub>2</sub>]  
 a) They are cheapest to find in the early development phases and the most expensive to fix in the late test phases. b) Faults are cheap to fix in the middle stages.  
 c) Faults are cheapest to find in the early development phases but the most expensive to fix then d) Although faults are most expensive to find during early development phases, they are cheapest to fix then
9. Assertion (A): Process of defect tracking must be automated as maximum as possible CO5 [K<sub>2</sub>]  
 Reason (R): The manual testing leads to data consistency, reduces human errors and communication losses.  
 a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A  
 c) A is true but R is false d) A is false but R is true
10. What is associated with the Product Risk? CO2 [K<sub>1</sub>]  
 a) Control of test item b) non-availability of test environment  
 c) Test object d) Negative consequences

**PART B (10 x 2 = 20 Marks)**  
**(Answer not more than 40 words)**

11. List any four features of good testing. CO1 [K<sub>1</sub>]

12. Under what circumstances, mutation testing is preferred?	CO1	[K <sub>2</sub> ]
13. What are the cascading effects of error?	CO2	[K <sub>1</sub> ]
14. Tell any two advantages and disadvantages of automated development.	CO2	[K <sub>1</sub> ]
15. State the metrics for software maintenance.	CO3	[K <sub>1</sub> ]
16. Name the general requirements for software quality metrics.	CO3	[K <sub>1</sub> ]
17. How do you calculate phase-based defect removal efficiency? Give an example.	CO4	[K <sub>2</sub> ]
18. Suppose Total number of Pre-production defects is 100 and Total number of Post-production defects is 5. Calculate Defect Removal Efficiency.	CO4	[K <sub>2</sub> ]
19. What are the techniques and models for the analysis of customer satisfaction data?	CO5	[K <sub>1</sub> ]
20. State the quantitative indicators and qualitative information needed for assessing in-process quality.	CO5	[K <sub>2</sub> ]

**Answer any FIVE Questions:-**  
**PART C (5 x 14 = 70 Marks)**  
**(Answer not more than 300 words)**

**Q.No. 21 is Compulsory**

21. A Test Analyst has to,	(9)	CO5	[K <sub>3</sub> ]
1. Design the test cases for 5 requirements			
2. Execute the designed test cases			
3. Log the defects and need to fail the related test cases			
4. After the defect is resolved, need to re-test the defect and re-execute the corresponding failed test case.			
For the above scenario, identify the different metrics to be considered and explain the role of each metric with reference to the scenario.			
ii. Why is testing a challenging task? Indicate the variety of challenges faced by the testers.	(5)	CO1	[K <sub>2</sub> ]
22. i. Consider a scenario that a customer should be able to login to online banking website with the correct password and user id while manager should be able to login to the website through customer login page. Prepare a requirement traceability matrix for the above requirement.	(7)	CO1	[K <sub>3</sub> ]
ii. With your own example, recall the efficiency of a testing team.	(7)	CO1	[K <sub>2</sub> ]
23. Enumerate the seven basic quality tools that are used during process improvement while developing a software. Illustrate them with suitable examples.		CO3	[K <sub>2</sub> ]
24. i. An organization implements a security system for its server. On one day, an attacker tries to crack the server. Out of 25 attempts, there is a probability that 95% of the attempts to crack the server has failed. The damage associated with each attempt is Rs.10,000/-.	(7)	CO2	[K <sub>3</sub> ]
1. Calculate the risk of implementation of the software on that day.			
2. If control is applied to the software, the cost of control is Rs.25,000/-. This can reduce the breaking attempts to 1.5%. Suggest whether the control will be recommended.			

- ii. Identify the different states in which a defect can be present. Present a brief overview of the states with a neat sketch. (7) CO2 [K<sub>2</sub>]
25. Draw the V-model for software testing. Highlight the validation activities associated with different phases in V-model. Also, compare and contrast the various activities in V-model with VV-Model. CO2 [K<sub>2</sub>]
26. Consider the statement: Rayleigh Model describes a model and its implementation as a reliability and projection model. Justify the statement with suitable explanation. Identify the similarities between Rayleigh model and Exponential Distribution and Reliability Growth Model. In what way, do they differ from one another? CO4 [K<sub>3</sub>]
27. i. Classify the Availability Metrics. Explore the relationships among availability, reliability, and the traditional defect-rate measurement. (7) CO5 [K<sub>2</sub>]  
ii. Present a brief overview of CMMI-based process maturity measures and illustrate how maturity and capability levels are determined. (7) CO5 [K<sub>2</sub>]

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