Paper ID : 250242

Roll No: | | | | | | | | | | | | |

MCA
(SEM IV) THEORY EXAMINATION 2024-25
SOFTWARE QUALITY ENGINEERING

TIME: 3 HRS   **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1.   Attempt _all_ questions in brief.   **2 x 10 = 20**

Q No.	Question	CO	Level
a.	How can the specification of a non-functional requirement directly impact software reliability?.	1	K2
b.	Explain how defect rate and software reliability are quantitatively related. Support your answer with a simple example or formula.	1	K2
c.	Define Defect Density and mention one factor that can influence its value.	2	K3
d.	How does Fix Response Time impact customer satisfaction in support-driven environments?	2	K3
e.	State one limitation of using the Exponential Distribution for software reliability.	3	K4
f.	What are Software Reliability Growth Models? Name one commonly used model.	3	K4
g.	State any two principles of Total Quality Management (TQM) as applied in software engineering.	4	K2
h.	What is the difference between quality planning and quality control in software development?	4	K2
i.	Define a proof of correctness, and when is it used in software development?	5	K3
j.	What is structural testing, and how is it different from functional testing?	5	K3

SECTION B

2.   Attempt any _three_ of the following: **10 x 3 = 30**

Q No.	Question	CO	Level
a.	Explain Defect Prevention and its activities. Mention the steps involved in Defect Prevention Techniques and Practices.	1	K2
b.	What is Defect Removal Effectiveness (DRE)? Explain its importance in software quality management. How does DRE vary across different development phases?	2	K3
c.	Discuss the Rayleigh Reliability Model in detail. Include its assumptions, applicability, mathematical expression, and relevance to project life cycle phases.	3	K4
d.	Compare and contrast any two software quality standards or models (e.g., ISO 9001, CMMI, Six Sigma). Discuss how each supports SQA processes and implementation.	4	K2
e.	Discuss the Evolutionary Nature of Verification and Validation. How does this concept influence the choice of testing strategies in agile and incremental development models?	5	K3

SECTION C

3.   Attempt any _one_ part of the following: **10 x 1 = 10**

Q No.	Question	CO	Level
a.	Discuss the role of documents and metrics in software quality assurance. How can documentation help in maintaining software quality throughout the development lifecycle? Provide examples of important quality-related metrics that are commonly tracked.	1	K2

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b.	Explain the concepts of Defect Prevention, Reduction, and Containment. How do these strategies differ, and what techniques can software developers use to implement each of these strategies effectively?	1	K2

4.   Attempt any *one* part of the following: 10 x 1 = 10

Q No.	Question	CO	Level
a.	Compare and contrast product quality metrics and in-process quality metrics. How do they complement each other in ensuring overall software quality?	2	K3
b.	Discuss the role of Customer Problems Metric and Customer Satisfaction Metrics in evaluating post-release product quality. How can these metrics drive continuous improvement in software products?	2	K3

5.   Attempt any *one* part of the following: 10 x 1 = 10

Q No.	Question	CO	Level
a.	Illustrate a real-world example where software quality assessment using hierarchical models has led to measurable improvement in a product's performance or customer satisfaction.	3	K4
b.	Explain the modeling process in the context of software quality management. Why is modeling important, and how does it support decision-making during software development?	3	K4

6.   Attempt any *one* part of the following: 10 x 1 = 10

Q No.	Question	CO	Level
a.	What is Statistical Quality Assurance (SQA)? How can statistical methods such as control charts or defect prediction models be applied to improve software quality?	4	K2
b.	Define the concept of Zero Defect Software. Is it achievable in real-world software projects? Justify your answer with reasons and examples.	4	K2

7.   Attempt any *one* part of the following: 10 x 1 = 10

Q No.	Question	CO	Level
a.	Explain the use and benefits of Static Testing Tools and Dynamic Testing Tools. Provide examples of each and describe how they complement each other in a complete testing process.	5	K3
b.	What are the key characteristics of modern software testing tools? Discuss how these characteristics help in improving the accuracy, efficiency, and maintainability of software testing.	5	K3