

MCA
(SEM IV) THEORY EXAMINATION 2022-23
SOFTWARE QUALITY ENGINEERING

Time: 3 Hours**Total Marks: 100****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 10 = 20

- a. List the types of costs of quality
- b. What are the requirements of customer problem metrics?
- c. Explain Defect Density.
- d. Differentiate between Fix response time and fix responsiveness
- e. Consider we have data on 1,650 units that have operated for an average of 400 hours. Overall, there have been 145 failures. Calculate the reliability at 850 hours
- f. Differentiate between prediction reliability models and estimation reliability models
- g. List any 4 SQA techniques.
- h. Describe the term “Zero defect Software”
- i. Explain the objectives of Software Testing Process.
- j. Extend Proof of Correctness from software testing to quality.

SECTION B

2. Attempt any three of the following: 10x3=30

- a. Differentiate between McCall's Quality Model and Boehm's Quality Model
- b. Demonstrate the significance of In-Process Quality Metrics for dealing with defect.
- c. Discuss the Rayleigh model of software quality management?
- d. Explain the process steps in Statistical Quality Assurance and how it is different from Software Quality Assurance.
- e. Differentiate between verification and validation in the context of software quality

SECTION C

3. Attempt any one part of the following: 10x1=10

- a. Explain Defect Prevention and its activities. Mention the steps involved in Defect Prevention Techniques and Practices.
- b. Contrast Defect Reduction with Defect Containment.

4. Attempt any *one* part of the following: 10x1=10

- a. Consider a software project with the following information domain characteristics for calculation of function point metric.
Number of external inputs (I) = 30
Number of external outputs (O) = 60
Number of external inquiries (E) = 23
Number of files (F) = 08
Number of external interfaces (N) = 02
It is given that the complexity weighting factors for I, O, E, F and N are 4, 5, 4, 10 and 7, respectively. It is also given that, out of fourteen value adjustment factors that influence the development effort, four factors are not applicable, each of the other four factors have value 3, and each of the remaining factors have value 4. Compute the function point value for this project.
- b. Illustrate the meaning of Function Points in relation to ISO/IEC Standards with its functional units & advantages of FPA.

5. Attempt any *one* part of the following: 10x1=10

- a. Determine the assumptions stated by Musa Basic execution model over Jelinski and Moranda Model.
- b. Demonstrate types of Reliability allocation models with suitable example.

6. Attempt any *one* part of the following: 10x1=10

- a. Express the relationship among Quality Assurance, Quality Planning and Quality Control.
- b. Demonstrate the components of SQA Architecture in detail.

7. Attempt any *one* part of the following: 10x1=10

- a. Classify various types of static and dynamic testing tools.
- b. Differentiate between structural testing and functional testing.