

[This question paper contains 2 printed pages.]

Your Roll No.....
आपका अनुक्रमांक.....

Sr. No. of Question Paper : 3629

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Unique Paper Code : 6202452401

Name of the Paper : Software Modeling

Name of the Course : B.Voc Software Development

Semester : IV

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The paper has two sections. Section A is compulsory. Each question is of 5 marks.
3. Attempt any four questions from Section B. Each question is of 5 marks.

Section A																																	
1	a)	Explain the activities involved in Verification and Validation.	5																														
	b)	What is SRS? Explain the following characteristics of SRS: Consistent, Traceable, Modifiable	5																														
	c)	A project involves high technical risk and use of new, untested technology. Which process model should be used to manage risks effectively? Explain.	5																														
	d)	Explain the Defect Life Cycle. Describe each stage from defect identification to closure.	5																														
	e)	What is Cohesion? A module contains a set of operations that are executed based on a control flag passed as a parameter. Identify the cohesion type and explain why it is not ideal.	5																														
	f)	What is a Risk Table in software project management? Explain its components	5																														
Section B																																	
2	a)	Compute the Function Point (FP) value for a software project with the following details: <table border="1"> <thead> <tr> <th>Measurement Parameter</th> <th>Count</th> <th>Low</th> <th>Average</th> <th>High</th> </tr> </thead> <tbody> <tr> <td>Number of user inputs</td> <td>30</td> <td>3</td> <td>4</td> <td>6</td> </tr> <tr> <td>Number of user outputs</td> <td>54</td> <td>4</td> <td>5</td> <td>7</td> </tr> <tr> <td>Number of user inquiries</td> <td>42</td> <td>3</td> <td>6</td> <td>9</td> </tr> <tr> <td>Number of files</td> <td>12</td> <td>7</td> <td>10</td> <td>15</td> </tr> <tr> <td>Number of external interfaces</td> <td>9</td> <td>5</td> <td>7</td> <td>10</td> </tr> </tbody> </table> Assumptions: • Measurement parameters are equally divided among low, average, and high complexity • Complexity Adjustment Factor (CAF) = 1.18 Calculate: 1. Unadjusted Function Points (UEP) 2. Final Function Points (FP) If the complexity adjustment factor changes from 1.18 to 1.10, how will it affect the final Function Point value?	Measurement Parameter	Count	Low	Average	High	Number of user inputs	30	3	4	6	Number of user outputs	54	4	5	7	Number of user inquiries	42	3	6	9	Number of files	12	7	10	15	Number of external interfaces	9	5	7	10	7
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	b)	Explain CMMI and its five maturity levels in detail. A software company currently has ad-hoc processes with no standardization and frequent project failures. - Identify its current maturity level - Suggest steps the company should take to move to the next level	8
3	a)	Assume that you have to build a software system that: (i) allows students to enroll in courses and access content, (ii) enables instructors to upload materials and evaluate students, and (iii) generates performance reports. Draw a Use Case Diagram and a Level-0 Context Diagram for the system.	7
	b)	A program accepts the following inputs: - Speed (S): 0 to 120 km/h - Time (T): 1 to 10 hours The system calculates the distance. Output: - If both inputs are within valid range → display Distance traveled (in km) - If any input is outside the valid range → display "Invalid Input" Design robust test cases for this program	8
4	a)	Explain the complete risk management process in software engineering	7
	b)	Write short notes on : - Unit Testing - Software Engineering as Layered technology - Software Quality Assurance - Alpha and Beta testing	8
5	a)	Create a flow graph and compute cyclomatic complexity. Also identify independent paths and regions: <pre> int check(int n) { int i = 0; while (i < n) { if (i % 2 == 0) printf("Even"); else printf("Odd"); i++; } return 0; } </pre>	7
	b)	Differentiate between Agile Scrum and Prototyping model. Describe Sprint Planning, Daily Scrum, Sprint Review, and Sprint Retrospective.	8

6	a)	Explain the concept of risk probability and impact. How are they used to calculate Risk Exposure? Two risks are identified: - Risk A: Probability = 0.6, Loss = ₹30,000 - Risk B: Probability = 0.3, Loss = ₹70,000 Which risk has higher exposure? Justify your answer.	7
	b)	Why is it important to use different types of metrics (product, process, and project) in software development? Explain how each contributes to overall software quality with examples.	8
7	a)	Explain McCall's Software Quality Model (1977). Describe its three categories and quality factors.	7
	b)	A development team fixes a bug but accidentally introduces new issues due to improper version handling. Explain how proper defect tracking and configuration control could have prevented this problem.	8