CHENNAI

Final Assessment Test(FAT) - NOV/DEC 2025

Programme	B.Tech.	Semester	Fall Semester 2025-26
Course Code	BCSE301L	Faculty Name	Prof. Elakya R
Course Title	Software Engineering	Slot	E2+TE2
		Class Nbr	CH2025260102456
Time	3 hours	Max. Marks	100

Instructions To Candidates

- Write only your registration number in the designated box on the question paper. Writing anything elsewhere on the question paper will be considered a violation.

Course Outcomes

CO1: Apply and assess the principles of various process models for the software development.
CO2:Demonstrate various software project management activities that include planning ,Estimations, Risk assessment and Configuration Management
CO3: Perform Requirements modelling and apply appropriate design and testing heuristics to produce quality software systems.
CO4: Demonstrate the complete Software life cycle activities from requirements analysis to maintenance using the modern tools and techniques.
CO5: Escalate the use of various standards and metrics in evaluating the process and product.

Answer all Questions (10 × 10 Marks)

01. Assume that MediCare Systems is building a life-critical medical device software that must comply with strict regulatory standards. The requirements are well-documented and any deviation could result in regulatory rejection. The client expects comprehensive documentation at each phase.
a) Outline and demonstrate the sequential phases that should be undertaken in this project. Justify the reasons which are appropriate for this context.(6 marks)
b) Create a hybrid process model combining Classical and Evolutionary approaches that could address both the regulatory requirements and flexibility.(4 marks)

[10] (CO1/K3)

02. A government organization is developing a complex traffic management system that involves hardware-software integration. This system consisting the subsystems such as sensors, cameras, control centers. The entire software development process requires coordination with the civil engineering teams.
a) State the system Engineering principles applied to this project. Describe the relationship between system engineering and software engineering in this context.(5 marks)
b) Compare the suitability of Spiral model versus V-model for this project, considering risk management and verification. Recommend one with justification.(5 marks)

[10] (CO1/K2)

03. Assume that CloudStore Ltd. is developing a cloud storage application. Initial estimates suggest 8 developers for 12 months. However, after 4 months, the project is 30% behind schedule. The client is pressuring for faster delivery and suggests doubling the team size.
a) Describe the implications of adding more developers at this stage using Brooks' Law. Calculate the potential impact on project timeline and productivity.(4 marks)
b) Develop an alternative project plan that includes scope adjustments, milestone realignment and risk mitigation strategies without significantly increasing team size.(6 marks)

[10] (CO2/K4)

04. An Agile team of 8 members is developing a social networking application using 2-week sprints. During Sprint 3, conflicts arise between front-end and back-end developers regarding API specifications. Additionally, metrics show that story completion rate has dropped from 85% to 60%.
a) Demonstrate the ways by which the Agile Project Management principles can be applied to resolve team dynamics issues. Propose specific Agile practices that could improve communication.(5 marks)
b) Recommend specific measurements and metrices and corrective actions to improve team velocity and project health.(5 marks)

[10] (CO2/K4)

05. An Agile team is developing a food delivery application. After Sprint 2, a major competitor launches a similar app with AI-based restaurant recommendations. The product owner wants to immediately add this feature, but it wasn't in the original backlog.
a) Outline the different aspects in which the requirements management of Agile differs from traditional approaches. (4 marks)
b) Develop a requirements change management process that balances agility with stability, including traceability mechanisms.(6 marks)

[10] (CO4/K3)

06. An airline booking system has a complex user interface with multiple screens such as search flights, select seats, enter passenger details, make payment and view booking confirmation. Users frequently abandon the booking process due to confusion and poor UI design.
a) Describe the user interface design problems and Identify specific usability issues.(4 Marks)
b) Design an enhanced user interface for this application. Also, provide the detailed descriptions of three key screens illustrating the proposed improvements.(6 marks)

[10] (CO3/K2)

07. An e-learning platform built with object-oriented design has multiple classes for User (Student, Instructor, Admin), Course, Assessment and Enrollment. Traditional testing approaches are being used, but class interaction bugs are frequently escaping to production.
a) Propose specific object-oriented testing strategies including state-based testing, class testing and integration testing approaches.(5 marks)
b) Create a comprehensive test design for any one critical class which covers inheritance testing, polymorphism testing and exception handling. Include 3 test cases for at least 2 methods.(5 marks)

[10] (CO3/K6)

08. Assume that CloudDocs Inc. have 5 development teams across different time zones working on the codebase. Recently, conflicts in code merges have increased, features are overwriting each other's changes and version control is chaotic.
a) Mention the process Software Configuration Management (SCM) should be implemented for this distributed development environment .(5 marks)
b) Describe any three SCM tools for this scenario. Recommend an SCM tool with a branching strategy that supports parallel development.(5 marks)

[10] (CO4/K5)

09. Consider that, the HealthApp developed a patient monitoring mobile app 3 years ago. Now they want to add telemedicine features, integrate wearable devices and comply with new HIPAA regulations. The original development team has mostly left and documentation is incomplete.
a) Identify the software evolution challenges in this scenario. Also mention the most significant technical and organizational challenges.(5 marks)
b) Demonstrate an evolution strategy that supports effective knowledge transfer and incremental feature addition. (5 marks)

[10] (CO4/K4)

10. SoftDev Corp wants to assess and improve their software development process. Current metrics show: 25% requirements change rate, 40% code coverage in testing, average 8 defects per module and 30% schedule overruns. They want to achieve CMMI Level 3 certification.
a) Analyze the current process maturity level based on the given metrics. Identify key process areas that need improvement to achieve CMMI Level 3.(5 marks)
b) Develop a process improvement roadmap specifying goals, key practices and metrics for each CMMI Level 3 Key Process Area (KPA). Prioritize implementation based on organizational impact.(5 marks)

[10] (CO5/K4)

BL-Bloom's Taxonomy Levels - (K1-Remembering,K2-Understanding,K3-Applying,K4-Analysing,K5-Evaluating,K6-Creating)