

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
B.Tech Degree S4 (R) Examinations April 2026 (2024 Scheme)

**Course Code: PECST411**  
**Course Name: SOFTWARE ENGINEERING**



Max. Marks: 60

Duration: 2 hours 30 minutes

**PART A**

*(Answer all questions. Each question carries 3 marks)*

		CO	Marks
1	List and explain the layers of Software Engineering.	CO1	(3)
2	Define functional requirements and non-functional requirements, and state key differences between them.	CO1	(3)
3	Differentiate between coupling and cohesion in software design	CO2	(3)
4	Explain the Abstract Factory design pattern with a suitable example.	CO2	(3)
5	Describe code review in software engineering and compare the different types of code review methods.	CO3	(3)
6	Why is software maintenance important, and what are the main types involved in maintaining a software product?	CO3	(3)
7	Define Lines of Code (LOC), Function Points, and Object Points as software project size metrics.	CO4	(3)
8	Explain how Gantt charts help in project scheduling and tracking in Software Project Management.	CO4	(3)

**PART B**

*(Answer any one full question from each module, each question carries 9 marks)*

**Module -1**

9	a) Explain the major phases in the waterfall model of software development. and list out any three situations where Waterfall model is applicable.	CO1	6
	b) What are the components of an SRS document?	CO1	3
10	a) Explain the techniques used for requirement elicitation and validation and write the need for requirement validation in software engineering.	CO1	6
	b) Analyze the advantages of the Agile Model over traditional software development models.	CO1	3

**Module -2**

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|----|--|-----|-----|
| 11 | Consider a Library Management System where a user searches for a book, checks availability, issues the book, and returns it. |     |     |
|    | a) Draw the state diagram for this system.   | CO2 | 4.5 |
|    | b) Draw the sequence diagram for this system.  | CO2 | 4.5 |
| 12 | a) Describe the working of Client–Server, Repository, and Publish–Subscribe architectural patterns with suitable examples.   | CO2 | 6   |
|    | b) Analyze the functionalities of Composite and Façade design patterns with suitable examples.                               | CO2 | 3   |

**Module -3**

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|----|---|-----|---|
| 13 | a) Analyze the different methods of black box testing and evaluate their effectiveness in software engineering.   | CO3 | 5 |
|    | b) Compare top-down, bottom-up integration testing methods with suitable examples.  | CO3 | 4 |
| 14 | Explain Continuous Integration, Continuous Delivery, and Continuous Deployment (CI/CD/CD) in DevOps automation with a neat architecture diagram and examples. | CO3 | 9 |

**Module -4**

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|----|--|-----|-----|
| 15 | a) Illustrate how virtualization enables cloud computing and explain IaaS, PaaS, and SaaS with appropriate real-world examples.                                | CO4 | 6   |
|    | b) Calculate the effort estimation in person-months and development time for a 70 KLOC software project using the Basic COCOMO model and interpret the result. | CO4 | 3   |
| 16 | a) Discuss the Six Sigma methodology and its applications in software engineering.   | CO4 | 4.5 |
|    | b) Describe the Capability Maturity Model (CMM) and the various stages of maturity levels.   | CO4 | 4.5 |

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