SRM Institute of Science and Technology

College of Engineering and Technology

School of Computing

SET - C

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Academic Year: 2024-2025 (EVEN)

ANSWER KEY

Test: FJ1

Course Code & Title:21CSC303J - Software Engineering and Project Management

Year & Sem: III & VI

Date: 19.02.2025

Duration: 100 minutes

Max. Marks: 50

Course Articulation Matrix:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	--	--	--	--	--	--	--	--	2	--	2	--
CO2	--	3	--	--	--	--	--	--	2	--	2	--

Note: CO1 : Identify the process of project life cycle model and process.
         CO2 : Analyze and translate end-user requirements into system and software requirements.

Part – A (10 × 1 = 10   Marks)
Instructions: Answer all
The duration for answering part A is **15 minutes** (this sheet will be collected after 15 minutes).

Q. No	Question	Marks	BL	CO	PO	PI Code
1	The _____ are applied throughout the software process. a) Framework activities **b) Umbrella activities** c) Planning activities d) Construction activities	1	1	1	5	1.1.1
2	An e-commerce platform development project for a retail company requires frequent user feedback, adaptation to seasonal trends, and consideration of competitor strategies. New features, such as personalized recommendations and flash sales, need to be implemented quickly without disrupting the existing system. Which software process model would best fit this scenario? a) **Agile Model** b) Prototyping Model c) RAD Model d) Waterfall Model	1	2	1	5	1.1.1
3	Who defines priorities and establish project constraints ? **a) Stakeholders** b) Software designers c) Software developers d) Customers	1	1	1	5	1.1.1
4	Choose the major advantage of using incremental model. **a) Customer can respond to each increment** b) Easier to test and debug c) It is used when there is a need to get a product to	1	1	1	5	1.2.1

	the market early d) Easier to test and debug & It is used when there is a need to get a product to the market early					
5	In a critical software project for a financial institution, where security and risk management are top priorities. The stakeholders want to ensure that potential risks are identified and addressed at every phase of development, rather than discovering major issues late in the process. Additionally, they prefer an iterative approach that allows continuous refinement of the system. Which software development model would be the most suitable for this project? a) Waterfall Model **b) Spiral Model** c) Incremental Model d) RAD Model	1	2	1	5	1.2.1
6	A food delivery application quickly to compete with existing platforms. They prioritize rapid prototyping and continuous user feedback to refine the app's features, such as real-time tracking and personalized recommendations. The development team follows an iterative approach**,** building and testing functional prototypes in short cycles to speed up deployment. a) Waterfall Model b) Spiral Model c) Incremental Model **d) RAD Model**	1	2	1	5	1.2.1
7	What is the correct order in which a software project manager estimates various project parameters while sing COCOMO? a) Effort,duration,cost,size b) Size,duration,cost,effort **c) Size,effort,duration,cost** d) Size,cost,duration,effort	1	2	1	5	1.2.1
8	Which of the following is NOT a common technique used for requirement validation? a) Prototyping b) Requirements Reviews c) Data Flow Diagrams (DFD) **d) Software Testing**	1	1	2	5	1.2.1
9	In a healthcare management system project for hospitals, the interaction between doctors, patients,	1	2	1	5	1.2.1

and stakeholders is crucial for the requirement-gathering process. What is the primary goal of this requirement-gathering process?

a) Writing code as quickly as possible
b) Understanding stakeholder needs and defining system requirements
c) Testing the software for bugs
d) Deploying the final product

| 10 | A software development team is working on a banking application and needs to estimate the project size based on user interactions, transactions, and reports. Instead of measuring the system by lines of code, they decide to use the Function Point (FP) metric, which focuses on _____.

 a)**Calculated from user requirement**
b)Calculated from lines of code
c)Calculated from software complexity Assessment
d)None of the above | 1 | 2 | 2 | 5 | 1.2.1 |

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CO1	--	--	--	--	--	--	--	--	2	--	2	--
CO2	--	3	--	--	--	--	--	--	2	--	2	--

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	Part – B (4 × 5 = 20 Marks) **Instructions: Answer any one**					
11	**Imagine you are leading a software development team working on a complex web application. You notice that the development process follows a structured approach, starting with requirement analysis, then moving to design, coding, testing, and finally deployment. Each phase seems to build upon the previous one, much like layers in a system.** **Given this observation, would you consider software engineering a layered technology? Why or why not?** **Answer :** Yes, software engineering can be considered a layered technology for several reasons: (i) Structured Phases: (ii) Each Layer Adds Value: (iii)Modular Approach. Based on the observation that the development process involves successive, organized layers, software engineering is indeed a layered technology, where each layer contributes to the overall success of the project.	5	2	1	5	1.2.1
12	**Consider you are developing a cricket game application. With the help of the prototyping model describe how would you design the application.** **Answer :** To design a cricket game application using the Prototyping Model, the process would involve an iterative approach where the application is built and refined over several cycles based on user feedback. • Requirement Gathering and Initial Prototyping • Gather Initial Requirements • Develop Initial Prototype	5	3	1	5	1.2.1

|						
	• User Feedback and Refinement • Revise the Prototype Based on Feedback • Final Prototype and Development					
13	**You have been assigned as the project manager for a new software development project in your company. Your responsibilities include defining project goals, estimating costs and timelines, allocating resources, monitoring progress, managing risks, and ensuring the final product meets the client's expectations.** **Based on your role, what key activities would you need to focus on to successfully manage the software project?** **Answer:** As a project manager, key activities include defining clear project goals, ensuring alignment with client expectations. You would need to estimate costs and timelines, balancing scope with available resources. Allocating the right resources and managing risks proactively are crucial for success. Monitoring progress through regular updates and adjusting plans as necessary will help maintain momentum. Finally, ensuring quality and delivering a product that meets the client's requirements is essential.	5	2	2	5	1.2.1

14	**A software project is estimated to be 800 KLOC (thousand lines of code). The project fits the organic mode category, meaning it involves a small, experienced team working on a familiar and relatively simple system. Using the COCOMO model, how would you calculate:**
	  The total effort required in person-months?
	  The estimated time needed to complete the project in months?
	
	Answer: Effort Estimation (Person-Months)
	  For the organic mode, the effort equation in the basic COCOMO model is:
	  $E = a \times (KLOC)^b$
	where:
	  a = 2.4 and b =1.05 are constants for the organic mode:
	Given 800 KLOC, we calculate:
	  $E = 2.4 \times (800)^{1.05}$
	 Total Effort Required = 2682 person-months (approx.)
	Time Estimation (Months)
	  The development time equation for the organic mode is:
	  $T = c \times (E)^d$
	Where:
	  E = Effort in person-months (calculated
		5	3	3	5	1.2.2

	above) 　　　C = 2.5 and d = 0.38 are constants for the organic mode: 　　　　T=2.5×(E)0.38 Estimated Time to Complete = 50.2 months (approx. 4 years and 2 months)						
15	**You are working on two different software estimation models for a project. One approach measures the project's size based on the number of lines of code written, while the other evaluates it based on the functionalities provided to the user, regardless of the programming language used. How would you differentiate these two approaches, and in what scenarios would each be more suitable?** **Answer :** 　The first approach, based on lines of code (LOC), measures the volume of code written and is language-dependent. It is more suitable for projects where the focus is on coding effort and complexity, often in low-level programming environments. 　The second approach, based on functionality (Function Points), evaluates the user-facing features regardless of the language used. It is ideal for projects where user requirements and features are prioritized, especially in business applications where functionality matters more than implementation details.	5	2	2	5	1.2.1
	Part – C (2 × 10 = 20　Marks) **Instructions: Answer all**					
16	**A multinational company is developing a hospital management system to manage patient records, appointments, billing, and inventory. The project has strict deadlines, requires high reliability, and must comply with government regulations. The client expects a well-documented system with minimal risk. However, during development, some requirements might change based on user feedback.** 　**(i)Identify the most suitable software process model for this project and justify your choice.** 　**(ii)　Compare your chosen model with at least one other software process model, highlighting advantages and disadvantages.** ## (i) Most Suitable Software Process Model: (5 marks) The Waterfall Model is the most suitable for this project. It follows a sequential approach, ideal for projects with strict deadlines, regulatory requirements, and a need for high reliability. Its structured documentation and clear deliverables align with the need for minimal risk and well-defined requirements. 　In this case, the Waterfall Model is more suitable due	10	3	1	5	1.3.1

		10	3	1	5	1.3.1
	to the strict deadlines, regulatory needs, and the need for clear documentation. In this case, the Waterfall Model is more suitable due to the strict deadlines, regulatory needs, and the need for clear documentation. (ii) Comparison of waterfall model with any other model (5 marks)					
	(OR)					

17	**A software development team is working on a** food delivery mobile application **using the Scrum framework. The team consists of a Scrum Master, Product Owner, and Developers**. The Product Owner gathers requirements from restaurant owners and customers, the Developers build and test features, and the Scrum Master ensures that the team follows Agile principles and resolves blockers.
	During a sprint, the Product Owner requests a major feature change based on user feedback. The Developers are concerned that this change will impact the sprint goal. The Scrum Master steps in to facilitate a discussion between the Product Owner and the Developers.
	1. Explain the roles and responsibilities of the Scrum Master, Product Owner, and Developers in this scenario.
	2. How should the team handle the requested change while ensuring the sprint remains productive? Justify your approach.
	
	1. Roles and Responsibilities:
	        Scrum Master: Facilitates communication, ensures the team follows Agile principles, removes blockers, and helps mediate between the Product Owner and Developers.
	- Product Owner: Gathers and prioritizes requirements, represents stakeholders, and ensures the team works on the most valuable features.
	        Developers: Build, test, and deliver the product increments, ensure technical feasibility, and meet sprint goals.
	2. Handling the Change:
	  The team should discuss the change in the sprint review or during a sprint planning meeting. If the change is important but cannot fit into the current sprint, the team should defer it to the next sprint or adjust the scope of existing features. This ensures the sprint goal remains intact and avoids disrupting progress. The Scrum Master can help facilitate this discussion and ensure alignment between stakeholders.
		10	3	1	5	1.3.1

18	Imagine you are part of a team developing a new mobile application for managing personal finances. You have been assigned the role of a Requirement Engineer. Describe how you would go about gathering, analyzing, documenting, validating, and managing the requirements for this application. Provide examples of the techniques you might use at each stage and explain why they are important. **Answer** : As a Requirement Engineer for the mobile application, my approach would involve the following steps: 1. Requirements elicitation; 2. Requirements analysis; 3. Requirements validation; 4. Requirements management.	10	2	2	5	1.2.2
	(OR)					
19	**A startup wants to develop an** e-commerce website **with features like product listings, user authentication, and payment integration. The project manager needs to estimate the cost based on factors such as development time, resource allocation, and technology stack. The client has a limited budget and expects a cost-effective solution. The team must choose an appropriate cost estimation model to ensure accurate budgeting.** Function Point Analysis (FPA) would be suitable for estimating the cost of this e-commerce website. However, given the limited budget and need for cost-effectiveness, the Function Point Analysis (FPA) is preferable as it estimates cost based on user-facing functionalities rather than just lines of code. Justification: FPA focuses on functionalities like product listings, authentication, and payment integration, making it ideal for web applications with clear business requirements. • More accurate budgeting as it considers complexity, transactions, and user interactions. • Technology-independent, allowing flexibility in choosing cost-effective solutions (e.g., open-source frameworks). • Helps in early-stage estimation, aligning with the client's budget constraints.	10	2	2	5	1.2.2

*Performance Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions

CO Mapping

CO1	CO2	CO3	CO4	CO5
10	9			

BL Coverage in %

- BL1 — 20%
- BL2 — 16%
- BL3 — 34%
- BL4 — 30%
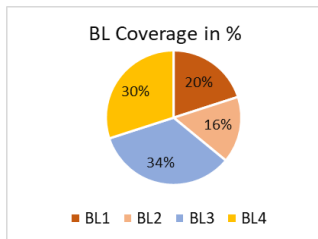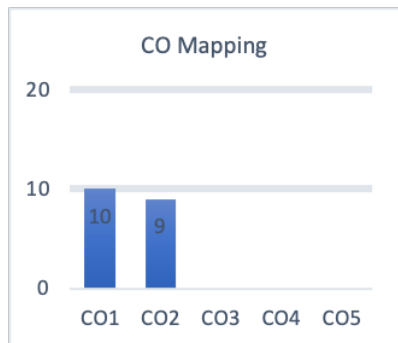
Approved by the Audit Professor/Course Coordinator