



MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)

Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi

Accredited by NAAC with A+ Grade & ISO 9001:2015 Certified Institution

Model Question Paper

First Semester MCA Degree Examination, 2025-26

Software Engineering

Time: 3 Hours

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

Module -1			M	L	C
Q1	a.	A company is developing a banking application where requirements are stable and well documented. Which process model would you apply and how would you use it for development? What do you think are the advantages and disadvantages in using this model. Can we use this model as a hybrid model with another process model? If Yes, illustrate how?	10	L3	CO1
	b.	When would you use an incremental process model for development? Let's say you have been given a task of architecting an online shopping application. How will you use the incremental model in this scenario? Identify the possible increments that can be delivered with a neat diagram.	10	L3	CO1
OR					
Q2		A startup develops a food-delivery application. Early prototypes receive positive feedback, but users begin to assume the prototype is the final system. Apply the Prototyping model and explain how you would manage user expectations while continuing prototype refinement.	10	L3	CO1
	b.	A large system uses multiple prototypes developed by different teams, leading to inconsistent interfaces and functionality. How will you use the Prototyping model to coordinate prototype development and ensure system uniformity.	10	L3	CO1
Module- 2					
Q3	a.	A university is developing an online examination system. Different stakeholders (students, faculty, and administrators) have conflicting expectations. Apply appropriate requirements elicitation techniques to gather and reconcile these requirements.	10	L3	CO2
	b.	A banking application must allow users to transfer funds and generate monthly statements. All transactions must be completed within 2 seconds and comply with security regulations. Apply requirements analysis and separate the functional and non-functional requirements.	10	L3	CO2
OR					
Q4	a.	A ride-sharing application allows users to book rides, track drivers in real time, and make digital payments. The application must display driver location updates every 3 seconds and run smoothly on low-end mobile devices. Identify the functional and non-functional requirements in this scenario.	10	L3	CO2

	b	A startup wants to develop a mobile fitness application, but users are unable to clearly explain the features they want. Apply suitable requirements elicitation techniques to gather accurate requirements and justify your choice.	10	L3	CO2
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Module - 3

Q5	a.	A video editing system processes video clips in stages: decoding, filtering, compressing, and exporting. Each stage can be replaced without affecting others. Identify the architectural style that can be used in this scenario. Justify your choice.	10	L3	CO3
	b.	A university information system stores all student, faculty, and course data in a central database. Multiple applications like library, exams, and attendance modules access the same data. Identify the architectural style that would suit this scenario and explain why it is suitable.	10	L3	CO3

OR

Q6	a.	An online banking app allows customers to check balances, transfer funds, and pay bills through mobile and web clients, with a central server performing all processing. Do you think a client-server architectural style would be suitable for this scenario. If yes, give your justification for the same and if not, which other style would you suggest and why?	10	L3	CO3
	b.	A stock trading platform broadcasts price updates to multiple dashboards, mobile apps, and alert systems. Traders subscribe to only the stocks they are interested in. Identify the architectural style and explain why it is appropriate for this scenario. What do you think are the advantages and disadvantages in using this style.	10	L3	CO3

Module – 4

Q7	a.	A bank ATM accepts PIN numbers that are exactly 4 digits long (0000–9999). Identify the valid and invalid equivalence classes and give one example of a test case from each class. In what situations will you decide to perform equivalence class testing for a given scenario.	10	L3	CO4
	b.	An online form accepts age between 18 and 60 years for registration. Identify the valid and invalid test cases using boundary value analysis. Compare equivalence class technique with the boundary value analysis technique in the way testing is employed given different scenarios.	10	L3	CO4

OR

Q8	a.	A bank processes a loan application based on: The age of the applicant (Must be between 21 and 60) The credit score (Must be above 700 to approve the loan) Answer the following questions 1) Identify the test cases to achieve 100% statement coverage. 2) Identify the test cases to achieve 100% branch coverage. 3) Identify the test cases to achieve 100% path coverage.	10	L3	CO4
	b.	A program calculates the total price of items including tax as follows: total_price = price + tax Identify the possible mutants in the above given code and design test cases that would kill these mutants. What do you think are the advantages of mutation testing?	10	L3	CO4

Module – 5

Q9	a.	A healthcare application is being developed for multiple hospitals. Regulatory requirements are constantly updated, leading to frequent changes in the system requirements. Identify the possible risks and suggest mitigation strategies when conflicts arise.	10	L3	CO5
	b.	During project planning, a software firm estimates that developing a library management system will require 40 person-months of effort. The average cost per person-month is ₹60,000, and the company wants a 20% profit margin. Identify the pricing approach and calculate the price to be quoted.	10	L3	CO5
OR					
Q10	a.	A company is developing a medical diagnosis software where failure can lead to serious consequences. How should the project manager plan quality management for this project? What is the next step he will use to evaluate the quality framework. What would be the outcomes he would expect after successful implementation of the framework?	10	L3	CO5
	b.	A project manager must estimate effort for a banking application that includes screens, reports, databases, and external interfaces. The programming language is not yet finalized. Which size metric should be used and why? Justify?	10	L3	CO5
