



VIT®

Vellore Institute of Technology
(Deemed to be University under section 3 of the UGC Act, 1956)

Reg. No. :

24MCA1034

Final Assessment Test(FAT) - Nov/Dec 2024

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| Programme | M.C.A. | Semester | Fall Semester 2024-25 |
| Course Code | PMCA504L | Faculty Name | Prof. A Sheik Abdullah |
| Course Title | Software Engineering | Slot | F1+TF1 |
| Time | 3 hours | Class Nbr | CH2024250103067 |
| | | Max. Marks | 100 |

General Instructions

- Write only Register Number in the Question Paper where space is provided (right-side at the top) & do not write any other details.

Course Outcomes

1. Demonstrate the basics of software engineering process, ethics and development
2. Understand the concept of various process models, activities and improvement
3. Analyze the various aspects of software requirement engineering and system models
4. Understand and analyze the decisions about the UML design process
5. Implement a computer-based system to meet the desired needs of the customer with proper understanding of the critical systems development and software testing

Section - I

Answer all Questions (10 × 10 Marks)

*M - Marks

| Q.No | Question | *M | CO | BL |
|------|--|----|----|----|
| 01. | <p>A financial institution is creating a new banking software platform that emphasizes risk management and routine security assessments. Core banking software and all of its interfaces that enable connections to other modular software and interbank networks are commonly referred to as banking software in retail banks. In the context of financial banking, "banking software" typically refers to the computer processing application software used to access the financial transactions. A paradigm for recurring risk assessments is necessary because of the increased security concerns. For this project, they are considering using the Spiral model.</p> <p>a. Illustrate in what way the risk management component of the Spiral model enhances the development of security-sensitive software (5 Marks)</p> <p>b. Mention the key characteristics which render it suitable for this particular project with the advantages specifying towards time and cost (5 Marks)</p> | 10 | 1 | 2 |
| 02. | Apply and justify a suitable software process model for developing automatic home management system which provides the ability for home owners to use mobile phones or wireless devices to remotely manage the electronic systems at home. | 10 | 2 | 3 |

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| 03. | <p>Consider an online bus booking system with the following requirements:</p> <ul style="list-style-type: none"> a. Bus service providers can include and cancel bus services for a particular route and they can provide special bus service on festival timings. b. Administrator takes care of inserting, deleting, modifying information about bus services. c. Bus service providers may give concession based on season timings, route, traveler age etc. d. Traveler can search and select a bus service by giving source and destination details. e. Traveler can book, print and cancel tickets. f. Traveler pays amount through net banking/credit/debit card. <p>Derive user stories and story map for the above requirements.</p> | 10 | 3 | 3 |
| 04. | <p>An e-Library website which is part of Integrated Library System also known as a Library Management System (LMS), and managed by a library or group of libraries. Users of the library can search library catalog online to locate various resources- books, periodicals, audio and visual materials, or other items under control of the library. Users may reserve or new item, provide feedback, and manage their account.</p> <ul style="list-style-type: none"> a. Identify at-least three Functional and non-Functional requirements for the system (3 Marks) b. Draw use case diagram for the library application and explain any two use case using use case description template (5 Marks) c. Identify and justify the requirement tasks for the given application (2 Marks) | 10 | 2 | 3 |
| 05. | <p>Assume that you have been assigned as a system analyst for software that needs to be developed for a whole sale pharmaceutical distributor automation system. The organization management in this business is for 5 years and they are having problems in the established manual system. The billing module involves complex business logic. The inventory module also needs to be taken care because it involves the expiry date as one of the criteria. The billing module and the inventory module must be developed stage by stage after getting approval by the management. The other modules like HR module, accounts module, customer relationship management module required to be developed in standard format only. They require high quality, moderate performance and latest configurable software. Draw appropriate any two behavioural diagrams for the given scenario.</p> | 10 | 4 | 3 |
| 06. | <p>Assume that you have been designated as a software engineer for an enterprise robotic automation company. The company keenly focus on material movements concerned with production and warehouse environments with the following key features:</p> <ul style="list-style-type: none"> a. Automation of trolley delivery routes b. Automation of material movement from conveyors c. Automation of pallet transport d. Automation of tugging carts <p>As a software engineer related to the production of autonomous mobile robots identify and elaborate requirement engineering phases for the given scenario with a neat diagram.</p> | 10 | 3 | 3 |

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| 07. | Hostel Management System (HMS) for college students is to be developed and the requirements are as follows: personal details of each student are maintained in the common repository once Roll Number is allotted through the student admission system. Students are given choices for the selection of hostel blocks, the type of room's etc. name and contact details of the parents are stored in the repository. The HMS makes the communication between the Hostel Management and the parents by sending information about monthly mess bill, ward's attendance details, etc. Communication happens both by SMS and by post. Warden of each block has to mark the attendance at 8 pm daily. Student representatives are involved in the food menu preparation and special dishes are given during the festival occasions and charged extra. Additionally students are given concession in their mess bills during the semester vacation period and on 3-4 consecutive holidays. Draw the appropriate any two interaction diagram for the given scenario with a neat representation. | 10 | 4 | 4 |
| 08. | Assume you have been designated as a quality analyst for a security product development company. The company offers integrated computer solutions with a secure product development framework which includes the aspects of the product's lifecycle including design, development, release and support. As a quality analyst, identify and elaborate different ISO 900 standards applicable for the given scenario and justify the same. | 10 | 5 | 3 |
| 09. | Consider you are about to deploy a software application for an online shopping portal which helps in purchasing all types of electronics, groceries, furniture, and home appliances. The application is made user-friendly with different sorts of functionalities that attract the customer with all the navigations till the purchase of the product. During the stage of payment gateway integration, the application integrates with a third-party payment gateway to complete the transaction. As a software developer in the assigned team, <ol style="list-style-type: none"> Write atleast 2 test cases to validate the process (4 Marks) Illustrate the test cases would you write to validate the process for failures such as payment declines or network interruptions? (3 Marks) Discuss at least 3 non-functional testing strategies applicable for the given scenario (3 Marks) | 10 | 5 | 2 |
| 10. | Consider that you have been assigned as a project developer in a hypothetical e-commerce web application. During the stage of deployment, it fails intermittently due to a dependency problem in the DevOps team which is directly related to the Continuous Integration/Continuous Delivery pipeline. <ol style="list-style-type: none"> Illustrate the methodological workflow concerned with identifying and fixing the problem mentioned above (5 Marks) Discuss at least 3 functional testing strategies for avoiding the issues (5 Marks) | 10 | 5 | 3 |

BL-Bloom's Taxonomy Levels - (1.Remembering, 2.Understanding, 3.Applying, 4.Analysing, 5.Evaluating, 6.Creating)

