VIT-AP UNIVERSITY

Final Assessment Test – Winter Semester (2024-25) –May 2025

Course Code: SWE2004	Maximum Marks: 100	Duration: 180 Mins
Set No: 02	Course Title: Software Design and Architecture	School: SCOPE
Date: 29/04/2025	Exam Type : Closed Book	Session: FN
	Slot: A1	

Keeping mobile phone/smart watch, even in 'off' position is treated as exam malpractice

General Instructions if any:
1. "f'series" -non Programmable calculator are permitted: NO
2. Reference tables permitted: NO

PART – A: Answer any TEN Questions, Each Question Carries 10 Marks (10×10=100 Marks)

1. Suppose you are leading the design of a large software project. What methods would you use to minimize coupling between different modules, and how would you ensure that this does not compromise the system's performance or capabilities? **(10 M)**

2. Discuss the essential software quality attributes that must be considered in the design and development of a Railway Reservation System. Explain how these attributes contribute to ensuring secure ticket transactions, accurate schedule information, and efficient management of high user traffic. **(10 M)**

3. Designing a Hospital Management System involves multiple interdependent modules like patient management, billing, appointment scheduling, and medical records. Considering the challenges of system complexity, module communication, scalability, and long-term maintenance, critically evaluate which design approach — Top-Down, Bottom-Up, would best suit this scenario. Support your decision with appropriate design principles and real-world considerations. **(10 M)**

4. Assume you are working on developing a School Management System. To design this application effectively, different software design strategies can be applied. Discuss these software design strategies and explain how each strategy can be used in designing different modules of the School Management System with suitable examples. **(10 M)**

5. While designing a real-time Online Examination System, which methodology — SADT or SSADM — would you choose to follow? Explain your selection by highlighting its advantages and suitability for this project. **(10 M)**

6. Define Structured Systems Analysis and Design Methodology (SSADM) in the context of software engineering. Describe its different stages, highlight the tools commonly used, and explain its key features and advantages in the effective development of software applications. **(10 M)**

7. While designing a Smart Home Automation System, what process control techniques would you adopt to manage the interaction and coordination of various smart devices like lights, fans, AC, and security systems? Explain how your approach would handle dynamic user commands, real-time responses, and ensure smooth device communication and system reliability. **(10 M)**

8. Assume a social networking platform like Facebook is facing performance and scalability issues due to a rapid increase in users, large data volume, and real-time interactions. As a software architect, suggest a suitable architectural style or design pattern to redesign the system. Explain how your proposed architecture would improve performance, handle large user requests efficiently, and support real-time data processing. (10 M)

9. Selecting an appropriate style of Shared Information System (SIS) plays a crucial role in the successful operation and management of any organization. Various factors need to be considered while choosing the most suitable SIS style, as it directly impacts data sharing, communication, security, and overall system performance within the organization. Discuss in detail the key factors that influence the selection of a Shared Information System (SIS) style in an organization. Further, explain how these factors help in designing an effective SIS architecture that meets the business objectives, operational needs, and future growth of the organization. (10 M)

10. Explain the concept of Shared Information System Styles in Software Design and Architecture. Discuss its purpose, types, and significance in enabling data sharing between multiple systems or components with suitable examples. (10 M)

11. Discuss the application of various types of Design Patterns — Creational, Structural, and Behavioral — in the development of an e-commerce website. Explain the role of each pattern with suitable real-time examples to demonstrate how they enhance the design, functionality, and maintainability of the system. (10 M)

12. Based on the given scenario of an Online Food Delivery Application, identify the appropriate Design Patterns that can be applied to address the specific problems mentioned. Explain the purpose and role of each Design Pattern used in this scenario to effectively solve the design challenges. (10 M)

QP MAPPING

Q. No.	E/A/T	Module Number	Marks	BL	CO Mapped	PO Mapped	PEO Mapped	PS Ma
Q1	E	1	10	3	1	1,2,3,4,5,6	-	
Q2	A	1	10	2	1,2	1,2,3,4,5,6	-	
Q3	A	2	10	2	2	1,2,3,4,5,6	-	
Q4	T	2	10	4	1,3	1,2,3,4,5,6	-	
Q5	T	3	10	3	1	1,2,3,4,5,6	-	
Q6	A	3	10	3	1	1,2,3,4,5,6	-	
Q7	E	4	10	2	1,2	1,2,3,4,5,6	-	
Q8	E	4	10	2	2	1,2,3,4,5,6	-	
Q9	A	5	10	4	1,3	1,2,3,4,5,6	-	
Q10	T	5	10	3	1	1,2,3,4,5,6	-	
Q11	A	6	10	3	1	1,2,3,4,5,6	-	
Q12	E	6	10	2	1,2	1,2,3,4,5,6	-	