VIT
Vellore Institute of Technology

REG.NO.: 24BIT0411

SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS
CAT-2
WINTER SEMESTER 2025-2026

SLOT: B1+TB1

Programme Name & Branch	: B. Tech. IT
Course Code and Course Name	: BITE307L, Software Engineering
Faculty Name(s)	: Dr. Jagadeesh G, Dr. Karthikeyan P, Dr. Prabhu J, Dr. Sujatha R
Class Number(s)	: VL2025260502947, VL2025260502956, VL2025260502945, VL2025260502959
Date of Examination	: 16.03.2026, 2:00 PM – 3:30 PM
Exam Duration	: 90 minutes Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Course Outcomes

3. Develop abstract models and architectural design for software development
4. Choose appropriate software testing and evolution strategies
5. Create an outline of software project management plan including risk, configuration and quality aspects

Q.No.	Question	Max Marks	CO	BL
1.	A national meteorological department plans to develop a weather forecasting system to monitor and predict weather conditions across the entire country. The system collects large amounts of data such as temperature, humidity, wind speed, satellite images, and rainfall measurements from multiple weather stations located in different regions. Different modules of the system perform tasks such as data analysis, forecasting, climate monitoring, and public weather reporting. All these modules need to access the same weather data so that forecasts and reports remain accurate and consistent. To ensure that all components work with the same updated information, the system designers decide to store all weather data in a centralized data repository that can be accessed by the different modules. **Question: Based on the above scenario, identify the architectural style suitable for this system and justify your answer. Explain how this architecture supports data sharing, centralized storage, and interaction between different system modules in the weather forecasting system.**	10	03	01

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2.	A software company is developing an automated system to screen applicants for a **Software Developer position**. Before candidates are allowed to attend the final interview, the system checks whether they satisfy certain eligibility requirements. The screening process considers four inputs: **years of professional experience, marks obtained in an additional certification test, undergraduate (UG) marks, and postgraduate (PG) marks in Computer Science or Information Technology**. According to the company's recruitment guidelines, a candidate must have **2–10 years of work experience, certification test marks between 50 and 100, UG marks between 60% and 100%**, and **PG marks between 65% and 100%**. If all the conditions are satisfied, the system displays the message **"Candidate Selected for Final Interview."** If any of these values fall outside the specified limits, the system displays **"Candidate Rejected."** Using the above scenario, perform the following: 1. Identify the **equivalence classes** for each input and design suitable **test cases using Equivalence Class Partitioning (ECP)**. 4 Marks 2. Determine the **boundary values** for each input parameter and design appropriate **test cases using Boundary Value Analysis (BVA)**. 4 Marks 3. Specify the **expected output** for each test case. 2 Marks	10	04	03
3.	In a software development process, developers first write test cases that define the expected behavior of the software before writing the actual program code. After writing the test, they develop the minimum code required to make the test pass and then improve the code structure without changing its functionality. **Question: Identify the development approach described in the scenario and explain its basic idea.**	10	04	03
4.	A retail company has been using an inventory management system developed about 15 years ago using an older programming language. Over time, several developers have modified the system to add features such as supplier management, stock alerts, and sales reports. Due to these frequent modifications, the system has become difficult to understand and maintain. The documentation is incomplete and the program structure is complex. Developers have also noticed duplicated code, long methods, and repeated conditional statements in different parts of the program.	10	04	02

	The company wants to improve the system so that it can work with newer technologies, but it does not want to replace the entire system because redevelopment would be costly and risky. Therefore, the development team decides to improve the existing system by analyzing the code, restructuring the program, and reorganizing the data where required. **Question:** Based on the above scenario, explain how **software re-engineering and refactoring** can be applied to improve the system. In your answer, discuss the **activities involved in software re-engineering** and explain how **refactoring techniques can help resolve issues such as duplicated code, long methods, and complex conditional statements.**			
5.	Following Project Consists of 9 activities, Construct a network diagram. Find the critical path of the project and project duration.	10	05	04

Activity	Precedence	Duration
A	-	6
B	A	4
C	E	3
D	C	4
E	-	5
F	G	7
G	-	3
H	F	2
I	B,D	1