REG.NO.:

VIT®

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

SLOT: C1 + TC1

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026

Programme Name & Branch : B.Tech & Computer Science and Engineering
Course Code and Course Name : BCSE317L & Information Security
Faculty Name(s) : Applicable to all
Class Number(s) : Applicable to all
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)

CO 1- Apply fundamental knowledge on key security concepts, access control and authentication.
CO2- Comprehend the use of security techniques for securing information.

Q. No	Question	M	CO	BL
1.	A hospital stores patient record digitally and physically. Recently, an unauthorized person accessed a patient's medical file. i. Identify the threat, vulnerability, and harm in this scenario. Also analyze the relationship between them in this case. (5 marks) ii. ii. Suggest three measures to ensure confidentiality and integrity of patient data. (5 marks)	10	1	1
2.	A global tech company discovers that confidential product designs have been leaked. Investigation reveals attackers used spear-phishing emails to compromise an executive's account and maintained access for six months without detection. Identify the APT characteristics in this attack. i. Explain why traditional perimeter defenses failed. (5 marks) ii. ii. Propose a layered security strategy to prevent such incidents (5 marks)	10	1	3
3.	You are designing a key management system for a cloud-based application that handles sensitive healthcare data. i. Propose a complete key management lifecycle for this system. Justify how your design addresses compliance and security requirements. (5 marks) ii. Design a hybrid encryption scheme for secure data transmission that uses both symmetric and asymmetric keys. Explain how keys will be exchanged and managed. (5 marks)	10	2	3

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4.	You are a developer for the VTOP "Digital Outpass" module. A student, Rahul, has a 9.2 CGPA but only 72% attendance in his "Computer Networks" class. He applies for leave to attend a family wedding. **Q1: Multi-Factor Rule Validation:** Rahul's proctor receives a notification. What Attribute-Based information should the system pull from the database to help the proctor make a decision? A) Rahul's residential address. B) A real-time summary of his attendance and any previous disciplinary "Red Tags." C) The name of the faculty teaching the "Computer Networks" class. **Q2: The "Emergency Override" Logic**: Suppose the university goes into a "Red Alert" (e.g., a local curfew or heavy storm). How can the administrator use Rule-Based Access Control to immediately stop all students from leaving, regardless of proctor approval? Task: Describe the global rule that would be added to the system.	10	2	3
5.	VIT University is launching an "Express Summer Semester" for students who failed core subjects. To manage this, the IT team must configure the VTOP Portal to handle a very specific set of requirements. You have been appointed as the System Architect to design the access control logic. The requirements are as follows: **Student Access:** Only students with a "Failed" status in a previous course can see the registration menu. **Credit Limit:** A student can register for a maximum of 2 courses (8 credits). Faculty Role: Professors can only view the list of students who have registered for their specific assigned slots. **Admin Override:** Only the "Controller of Examinations (CoE)" role can authorize a student to register for a 3rd course in exceptional cases. **Location Constraint:** Faculty must only be able to "Freeze" (finalize) internal marks while connected to the VIT-Campus-WiFi. Access from home networks must be blocked for this specific action. **Time Window:** Registration opens for Final Year students at 9:00 AM and for others at 11:00 AM. Part A: Identification (5 Marks) Identify which of the requirements above fall under Role-Based Access Control (RBAC) and which fall under Rule-Based Access Control (RuBAC). Part B: Show how the system should decide whether to allow a Faculty member to "Freeze Marks." (Hint: Use variables like User_Role, Network_SSID, and Action_Type.) Part C: System Conflict (5 Marks) A Final Year student (Role: Student) attempts to register for a 3rd course at 10:00 AM. They have already registered for 2 courses. Which Rule will block them first? What specific Role must intervene to bypass this, and how does the system validate that intervention?	10	2	3

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