



VIT

Vellore Institute of Technology
(Named as the University under section 3 of UGC Act, 1956)

REG.NO

NAME OF THE SCHOOL
Re-CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2025-2026

SLOT:

Programme Name & Branch : B.Tech. CSE (Specialization in IoT)
Course Code and Course Name : BCSE316L, Design of Smart Cities
Faculty Name(s) : Dr. B. Kalaavathi
Class Number(s) : VL2025260102407
Date of Examination : 03-11-2025
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
CO2: Comprehend the knowledge of urban planning and sustainability in smart cities.
CO3: Analyze the security issues and challenges of smart cities and their advancements.
CO4: Incorporate project management, planning, and stack holders in the design and development of smart cities.

Q. No	Question	M	CO	BL
1.	A large, urban municipality is facing increasing pressure to reduce its carbon footprint and transition to a more sustainable energy model. The city is considering investing in smart city technologies to improve energy efficiency, reduce emissions, and enhance grid reliability. Develop a plan outlining any five key strategies and challenges that the municipality should consider as it embarks on this digital transformation.	10	CO2	BL4
2.	The city of Metropolis has implemented a wide range of interconnected smart city systems to improve urban living, including smart traffic lights, public transportation networks, energy grids, and surveillance systems. These systems rely on real-time data and advanced algorithms to manage city operations efficiently. One day, a city employee, John, accidentally downloads malware onto the city's central control system by opening a malicious email attachment. The malware spreads through the city's network, infecting various smart systems. Soon, the attacker, Mallory, launches a ransomware attack, encrypting critical infrastructure data and demanding a ransom in exchange for the decryption keys. a) How did the attacker compromise the city's smart systems and what will be the possible consequences of the attack? b) What aspects of the smart city infrastructure were compromised in this attack? c) How could smart cities have protected against such an attack?	10	CO3	BL3
3.	In the smart city 'Wales' a Wireless Sensor Network (WSN) connects numerous IoT devices and sensors across the city to a central base station that collects and processes this data to help manage city infrastructure. An attacker Eve initiates an attack by compromising a node near the base station. This malicious node attracts all network traffic by falsely	10	CO3	BL4



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	advertising itself as having the shortest route to the base station.		
	Consequently, most of the network's data is routed through the compromised node, preventing the base station from receiving accurate data. a) What is the type of attack happened in the scenario and how it affect the overall security of smart city's WSN? b) How can smart cities secure their WSNs against these attacks, what are the possible detection and mitigation strategies?		
4.	i. _____ can be used to benchmark functional and technical performances ii. _____ is a prominent initiative in using standardized city data to create smart cities iii. _____ assesses several socioeconomic aspects of development in smart city. iv. Using green technologies to reduce carbon emissions, promote energy conservation, and increase green spaces will come under _____ v. _____ is critical to the understanding of the use of information systems in appropriate ways. vi. Which stage of SHM involves converting sensor readings into useful information? vii. Which of the following cannot directly measure damage in SHM? A) Sensors B) Feature extraction algorithms C) Structural models D) Statistical classifiers viii. _____ is the main objective of Structural Health Monitoring. ix. A Sybil attack in IoV involves _____ to mislead the system. x. _____ IoV layer handles data collection from vehicle sensors.	10	CO4
5.	Chennai's metro system plans to adopt Structural Health Monitoring as part of its smart infrastructure initiative. However, the project faces multiple challenges such as sensor installation delays, increased project costs, issues of data corruption/inefficiency, and frequent policy changes affecting technology deployment. Discuss the key steps in implementing, type of risks the SHM project is facing and suggest strategies to mitigate the challenges mentioned above.	10	CO4
