VIT
Vellore Institute of Technology

REG.NO.: 22BCS0325

SLOT: A1 + TA1

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2025-2026

Programme Name & Branch	: B.Tech CSE and other specializations
Course Code and Course Name	: BCSE314L - Privacy and Security in IoT
Faculty Name(s)	: Prof. Swetha.N.G., Prof. Ganesh Shamrao Khekare
Class Number(s)	: VL2025260102390, 2393
Date of Examination	: 05.10.2025
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: Assess the need for Privacy and security model for the Internet of Things.
  CO4: Design security framework and solve IoT security issues.

Q. No	Question	Module	Marks	CO	BL
1.	Consider a logistics company using an IoT–Blockchain platform to track 10,000 shipments. Design a testing framework that evaluates scalability, latency, and fault tolerance. Discuss the limitations of traditional testing methods and justify how your approach provides a better fit.	3	10	CO 4	BL 3
2.	A wireless sensor network has 6 sensors S={A,B,C,D,E,F} and 5 storage nodes Y={y1,y2,y3,y4,y5}. The assignment of colours (Storage nodes) for each sensor is as follows: • C(A)={y1,y2,y3} • C(B)={y2,y3,y4} • C(C)={y3,y4,y5} • C(D)={y3,y4,y5} • C(E)={y2,y3,y4} • C(F)={y2,y3,y4} a) Draw the bipartite graph with sensors on the left and storage nodes on the right, connecting edges according to the given assignments. b) Identify and list all the privacy pairs formed from this assignment. c) Construct the Spatial Privacy Graph (SPG) by projecting the bipartite graph onto the sensor set, where an edge exists between two sensors if they share at least one storage node. d) Analyse whether the load distribution across the storage nodes is balanced, and justify your answer. e) Suggest a new assignment that ensures a balanced load across the storage nodes.	4	10	CO 2	B
3.	a) In the context of a university building, explain how IoT-driven lighting and HVAC systems can contribute to lowering energy consumption.	4	5	CO 2	

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	b) Identify the different sensors that can be used in developing a smart office. Illustrate the IoT architecture supporting these devices, and categorize each sensor under the appropriate smart building component, providing justification for your classification.	4	5	CO 2
4.	A WBSN has **n = 3** sensors: Blood Pressure (BP), Glucose, Body Temperature. The data structures stored in Mobile Gateway (MG) are as follows, **Median Value Table (MVT)** **Range Value Table (RVT)** **Key Value Table (KVT)** The current reading obtained from the sensors are tabulated as follows, Using the One-Time Mask (OTM) scheme, perform the following tasks: I. Compute the data uploaded to the back-end cloud for sequence numbers 0001 and 0002. II. Demonstrate how an authorized MA retrieves the original data for sequence number 0002.	5	10	C
5.	Contributor B submits an air quality reading of 50, whereas the inferred ground-truth is 100. Contributor B's current reputation is 100. Similarly, Contributor C submits a value of 20, with the ground-truth being 100, and their current reputation is also 100. Calculate the bias ratio for both contributors. Apply the following reputation evaluation policies I. Threshold Bias Linear Adjustment II. Exponential Bias Linear Adjustment III. Exponential Bias Exponential Adjustment for both B and C using a threshold of 0.1 (assume k=1). Compare the resulting new reputation values for both contributors and identify which reputation evaluation scheme is more effective. Provide a justification for your conclusion.	5	10	

Sn	M1	M2	M3
0001	75	115	365

Sn	R1	R2	R3
0001	15	7	3

Sn	K1	K2	K3
0001	10	7	3
0002	12	5	2

Sn	D1	D2	D3
0001	70	112	365
0002	73	116	375

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