



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

Programme Name & Branch : B.Tech (CSE & IoT)
Course Code and Course Name : BCSE310L(IoT Architectures and Protocols)
Faculty Name(s) : Srimathi C
Class Number(s) : VL2025260102368
Date of Examination : 11.10.2025
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

CO3. Design basic circuits using sensors interfacing, data conversion process and shield libraries to interface with the real world.

CO4. Build and demonstrate the project successfully by sensor requirements, coding, emulating and testing

Q. No	Question	Module	Marks	CO	BL
1.	Write a Audrino sketch and circuit Diagram to build a traffic lights system: • There are 3 LEDs with different colors (green, yellow and red) to mimic the traffic lights for the vehicles • There are 2 LEDs with different colors (green and red) to mimic the traffic lights for the pedestrians • There is a pushbutton to mimic the ones in the pedestrian traffic and beep sensor to raise the alarm if the ambulance is waiting near the traffic signal. Traffic lights green, yellow and red for the car will glow for 25 sec, 5 sec and 20 sec respectively until the pedestrian button is pressed. But once the pedestrian button is pressed the green traffic light of the car gets reduced to 20 seconds and red light increases to 40 sec. simultaneously the green light of the pedestrian should glow for 40 sec and red light for 20 sec. If we hear the beep sound the green light of the traffic car should glow for 10 sec immediately followed by usual pattern.	4	10	3	3
2.	An IoT network has large number of nodes. As part of resource management, these nodes have formed as 4 clusters and elected cluster head for each cluster. The cluster heads CH1, CH2, CH3 and CH4 are located at distance of 900m, 700m, 500m, 300m from base station. The energy being dissipated to run the transmitter is 90 nj/bit	5	10	3	3



VIT

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	, the energy dissipation of the transmission amplifier is 500pj/bit/m2 and path-loss exponent is 2.5 Compute transmission cost and reception cost of a packet in nj where the packet size is 10 bytes. Compare the amount of energy used in direct transmission against amount of energy used in minimum energy transmission.				
3.	a) Protothread is a memory-efficient programming abstraction that shares features of both multithreading and event-driven programming. Illustrate the statement with Contiki OS with its architecture.	4	5		
	b) Collection Tree Protocol facilitates hierarchical tree topology allows for easy addition of new nodes without major overhead. Enumerate the CTP with its <u>header</u> and with the <u>roles</u> and <u>responsibilities</u> of its <u>routing module</u> .	4	5	4	4
4.	a) Design an IoV (Internet of Vehicles) as integral part of the WoT with its infrastructure and tools as both application and platform developer. Improve the design by integrating different layers and briefly explain the role of each layer.	6	5		
	b) Web Application Messaging Protocol (WAMP) is a sub-protocol of WebSocket which provides <u>publish-subscribe</u> and <u>remote procedure call (RPC) messaging patterns</u> . Analyse the above with the <u>Amazon Auto Scaling service</u> .	6	5	3	3
5.	OVF provides the <u>physical compute, storage, and networking nodes</u> are deployed at multiple sites and regions and to support locality and workload. Interpret the <u>innovation of OVF</u> , its <u>framework requirements</u> and reference points with an <u>architecture diagram</u> .	5	10	4	3