University of Information Technology & Sciences (UITS)

Faculty of Science and Engineering

Department of Computer Science and Engineering

Program: B.Sc. in CSE

Term Final Examination, Spring-2023

Course Title: Internet of Things

Course Code: CSE 401

Marks: 50 **Time: 3*(three)* hours**

(Answer all questions)

Q. No.			Marks
1.	a)	Let you have to design a structural health monitoring system. Now determine the IoT levels with examples.	[04]
	b)	The gateway of IoT plays an important role in the overall system. Illustrate the role of a gateway in IoT.	[03]
	c)	How do data collection and analysis approaches differ in M2M and things in IoT?	[03]
2.	a)	Briefly explain the role of a transaction manager in NETCONF.	[04]
	b)	Demonstrate the limitations that make SNMP unsuitable for IoT systems.	[06]
3.	a)	Write a short note on cloud computing and virtualization.	[02]
	b)	Describe the services of cloud computing.	[03]
	c)	Home Automation is a popular IoT project. Design domain model of the home automation IoT system.	[05]
4.	a)	Define PWM. Explain how we can use it in a smart lighting system.	[03]
	b)	Explain SMQTT protocol with block diagrams.	[04]
	c)	Differentiate between Arduino and Raspberry pi controller.	[03]
5.		Imagine a smart city called "TechTown" that has implemented IoT technologies throughout its infrastructure. The city is equipped with a network of sensors, smart devices, and data analytics systems to enhance urban services and improve the overall living experience. TechTown has recently faced a significant challenge in managing traffic congestion during peak hours. As the Chief Technology Officer (CTO) of TechTown, you have been assigned the task of developing an IoT-based solution to tackle this issue.	[06]
	a)	Explain how the system would work, what types of IoT devices and sensors would be used, and how the data collected from these devices can	[03]

be utilized to optimize traffic flow and improve the commuting experience for residents.

b) Describe an innovative scenario utilizing IoT technologies that could help alleviate traffic congestion in TechTown during peak hours. **[04]**

c) In your answer, highlight the benefits that such a solution would bring to TechTown, including reduced travel time, improved fuel efficiency, minimized environmental impact, and enhanced safety for commuters. **[03]**