MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

I SEMESTER M. TECH (Internet of Things)
END SEMESTER EXAMINATION DECEMBER 2023
IOT Architecture and Protocol (ICE 5117)

Note: Answer All questions.

Time:3 Hours **MAX. MARKS: 50**

Instructions to Candidates:
Answer **ALL** the questions.

Q. No.	Description	M	CO	PO	BL
1A	Develop a comprehensive plan for establishing two distinct local area networks (LANs) with different IP addresses using Cisco Packet Tracer.	**3M**	1	1	3
1B	Explore strategies for connecting the two local area networks created in part (a) using Cisco Packet Tracer. Design and configure the necessary networking components, such as routers or switches, to enable seamless communication between the two LANs.	**3M**	1	1	3
2A	Identify and list the necessary components required for a typical smart home, considering devices such as sensors, actuators, smart appliances, and security systems.	**3M**	2	3	3
2B	Detailed the process of installing a server within the smart home network using Cisco Packet Tracer. Provide step-by-step instructions for configuring the server to manage smart home devices.	**4M**	2	3	3
2C	Ensure to justify your design decisions, consider scalability, and discuss potential challenges in implementing and maintaining the smart home network	**3M**	2	3	4
3A	Evaluate the potential impact of IIoT on traditional industrial processes and manufacturing. What are the key advantages and challenges associated with the integration of IIoT technologies in these environments?	**4M**	4	4	4
3B	Predict and justify the emerging trends in IIoT for the next decade. Consider advancements in edge computing, 5G connectivity, and other technological developments that may influence the evolution of IIoT.	**3M**	4	4	4
4A	Explore strategies for organizations to monetize the data generated by IoT devices.	**4M**	5	7	4
4B	Develop a business model that leverages IoT-generated data as an asset.	**3M**	5	7	4

PTO

5A	Design a prototype using a Raspberry Pi to control home lighting through the internet. Identify and list the necessary hardware components required for the prototype.	**5M**	3	3	3
5B	Implement code that allows users to send commands over the internet to turn the lights on or off	**5M**	3	3	3
5C	Develop a detailed hardware design plan for automating the gate of a parking slot using Arduino Uno. Justify your choice of motor (servo or DC motor) and elaborate on the connections between the motor and Arduino Uno. Provide a comprehensive explanation of the code logic to automate the gate.	**5M**	3	3	3
5D	Design a system that utilizes sensors (infrared or ultrasonic) to detect the presence of vehicles in parking slots. Illustrate the connection scheme between these sensors and Arduino Uno, specifying the type of data relayed by the sensors. Develop a sophisticated Arduino program that interprets sensor inputs to determine the real-time availability of parking slots,	**5M**	3	3	3