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

SECOND SEMESTER M. TECH (INTERNET OF THINGS)
END SEMESTER EXAMINATIONS MAY 2024

INTERNET OF THINGS SECURITY (ICE 5417)

Time:3 Hours **07-05-2024** **MAX. MARKS: 50**

Instructions to Candidates:

- Answer **ALL** the questions.
- Assume all missed data.

Q. No.	Description	M	CO	PO	BL
1A	With numerous interconnected devices, Internet of Things (IoT) expands our technological landscape, but also introduces new attack vectors. What are some common vulnerabilities and threats in IoT environments, and how do they expose these devices and networks to security breaches?	**5M**	1	1,2	3
1B	In IoT systems, how does a cross-layer security approach, which integrates security measures across all architectural layers enhance overall system resilience against security threats? Can you provide examples of how security at one layer can benefit security at another in an IoT context?	**5M**	2	1	3
2A	In the event of an attack on an IoT system, what strategies and tools can be employed to effectively mitigate the impact of the attack and secure the affected devices and networks? Provide examples of successful mitigation approaches in IoT security.	**5M**	3	1,3	3
2B	In the context of the Internet of Things (IoT), how do digital signatures ensure data integrity and facilitate the verification of both the authenticity and unaltered state of data transmitted between devices?	**5M**	4	1,2	3
3A	Compare and contrast Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS). Explain the key differences in their functionalities and how they complement each other in a network security strategy.	**5M**	4	1,2	4

3B	For securing communication in resource constrained IoT devices, how do symmetric and asymmetric cryptography differ in terms of key management and usage scenarios? Explain why symmetric cryptography is generally preferred for such devices.	**5M**	4	1,2	4
4A	While traditional security measures struggle with vast networks of devices, how can blockchain's decentralized structure enhance authentication and authorization within the ever-growing realm of IoT?	**5M**	5	1	4
4B	How do HIPAA and similar global regulations impact data security for patient information collected by medical devices?	**5M**	5	1	4
5A	What safety regulations and environmental standards (e.g., ISO 14001) must be considered when deploying Industrial IoT systems to ensure responsible and compliant operations?	**5M**	5	1	4
5B	How can resource-constrained IoT devices achieve secure authentication beyond traditional methods? Discuss any two alternative approaches.	**5M**	5	1	3