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

II SEMESTER M. TECH (INTERNET OF THINGS) END SEMESTER EXAMINATIONS MAY 2024 WIRELESS SENSOR NETWORKS IN IOT (ICE 5413)

	Time:3 Hours 09-05-2024	MAX.	MAR	KS: 50	
	Instructions to Candidates:				
	 Answer ALL the questions. 				
Q.No.	Description	Μ	СО	PO'S	BL
1A	Compare SPI and I2C in the context to sensor node.	2	1	1,2	3
1B	Elucidate the key features and functionalities of Contiki, the operating system commonly employed in wireless sensor networks (WSNs).	g 3	2	1,2	3
1C	Detail the procedure involved in designing contention-free MAC protocols for traffic management.	s 5	2	4,5	3
2A	Enumerate the benefits of Zebra MAC (Z-MAC).	3	3	1,2	3
2B	Debate critical variances existing between the structure, functionality, application scenarios of destination-sequenced distance vector and sensor protocols for information via negotiation within wireless sensor networks.	3	3	1-4	4
2C	Appraise key principles underlying the geographic and energy aware routing protocol at the network layer in wireless sensor networks. How do they contribute to optimizing routing efficiency and energy conservation	e 4	3	1-4	4
3A	Plan the implementation of time-stamping within the flooding time synchronization protocol demonstrating a sophisticated understanding o synchronization mechanisms and their practical applications in wireless sensor network protocols.	e 4 f	4	1-5	4
3B	Derive the equation for computation of node position using Trilateration and Triangulation.	6	4	4-5	3
4A	Examine the significance of GPS-based localization in enhancing the effectiveness of wireless sensor networks for border surveillance.	ə 3	4	1-3	3
4B	Address the challenges inherent in utilizing an ad hoc positioning system (APS).	ר 3	5	1-3	3
4C	Elaborate on the strategies employed to defend aggregation attacks using a secure segregation tree.	6 4	5	1-3	3

- 5A In what ways do the inherent security challenges within wireless sensor 5 5 1-4 4 networks affect the integrity of the network and the protection of data.
 What innovative solutions could be proposed to alleviate these effects?
- 5B Analyze how physical layer denial of service (DoS) attacks impact both 3 5 3-5 4
 the operational efficiency and security of wireless sensor networks.
- 5C Contrast the lighthouse localization approach with multi-sequence 2 5 3-5 3 positioning.