Reg. No.															

B.Tech. DEGREE EXAMINATION, DECEMBER 2023

Sixth Semester

18CSE451T – WIRELESS SENSOR NETWORKS

(For the candidates admitted from the academic year 2020-2021 & 2021-2022)

Note:

(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours | Max. Marks: 100

PART – A (20 × 1 = 20 Marks)

Answer **ALL** Questions

	Marks	BL	CO	PO
1. The commercial standard of IEEE 802.15.4 is (A) Zig bee (B) Bluetooth (C) Wi-Fi (D) LTE network	1	1	1	1
2. A radio transceiver in wireless sensor networks contains which components internally? (A) Wire (B) Electrode (C) Antenna (D) Battery	1	1	1	1
3. XYZ node architecture consists of mobility subsystem that is attached with (A) Power management subsystem (B) Sensing subsystem (C) Communication subsystem (D) Interfacing subsystem	1	3	1	2
4. In wireless sensor networks the network layer is responsible for finding (A) Energy efficient route (B) Shortest route (C) Minimum cost (D) Maximum cost	1	3	2	2
5. Which of the following approach uses two signals that travel with different velocities? (A) One way – TOA (B) Two way – TOA (C) TDOA (D) Angel of arrival	1	1	2	1
6. What is the full form of SPS? (A) Standard positioning service (B) Satellite positioning service (C) Spatial positioning service (D) Station positioning service	1	1	1	1
7. What are the examples for fixed assignment in contention based protocol? (A) FDMA, TDMA, CDMA (B) Polling, token passing, reservation based (C) ALOHA, CSMA, MACA, MACAW (D) FDMA, TDMA, CDMA, CASMA	1	1	1	2
8. The main goal of the _____ is to reduce energy waste caused by idle listening, collision, over hearing and control overhead (A) IEEE 802.15.4 standard (B) S-MAC protocol (C) Message passing (D) Slotted ALOHA	1	2	4	1

9. The distance between sensors node and the light source can be expressed as 1 1 2 1

(A) $d = b / 2\cos^{\alpha} / 2$ (B) $d = 2\sin^{\alpha} / 2 / b$

(C) $d = 2\cos^{\alpha} / 2 / b$ (D) $d = b / 2\sin^{\alpha} / 2$

10. In pattern MAC, the pattern of 0001 and N = 7 indicates? 1 3 2 1

(A) A node planned to awake during 3rd and 7th slot of the period (B) A node planned to awake during 4th and 7th slot of the period

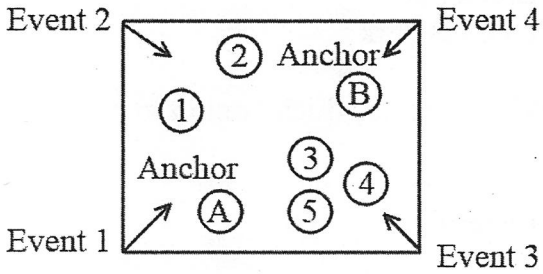
(C) A node planned to awake during 3rd and 8th slot of the period (D) A node planned to awake during 4th and 8th slot of the period

11. Applications where the coded signal is carried directly over a medium without having to overlay it onto a carrier signal is called 1 2 2 1

(A) Base band (B) Broad band

(C) Unlicensed (D) Licensed

12. What is the node sequence of event 1 in the figure? 1 3 2 1



(A) 1-2-B-A-3-5-4 (B) 4-5-B-3-A-2-1

(C) A-1-5-3-4-2-B (D) B-2-3-1-4-A-5

13. Which of the following is not the requirement of routing function? 1 2 3 3

(A) Correctness (B) Robustness

(C) Delay time (D) Stability

14. The routing technique in WSN, which requires no network information required is _____. 1 2 3 1

(A) Flooding (B) Variable routing

(C) Fixed routing (D) Random routing

15. The objective of wireless sensor networks routing path selection is to 1 1 3 1

(A) Maximize energy consumption (B) Maximize the life time of the networks

(C) Minimize the lifetime of the network (D) Minimize the overall number of sensors in the WSN

16. The SPIN belongs to the category of 1 1 3 2

(A) Flat based routing protocol (B) Hierarchical based routing protocol

(C) Location based routing protocol (D) Hybrid routing protocol

17.	The sensor applications data model describes (A) The flow of information between the sensor nodes and the data sink (B) The flow of information between sensors nodes (C) The flow of information between data sinks (D) The flow of information between the WSNs	1	2	4	1
18.	WSN middleware is a software infrastructure that glues together the following (A) Software package and operating systems (B) Network hardware, OS, stacks and applications (C) Hardware infrastructures (D) Stacks and applications	1	1	4	2
19.	The important operating system challenges in WSN (A) Cross layer design (B) Energy consumption (C) Bandwidth demand (D) QoS	1	2	4	1
20.	In WSN, _____ is a network security system that monitors and control incoming and outgoing network traffic based on predetermined security rules (A) Spyware (B) Cookie (C) Spam (D) Firewall	1	1	1	2

PART – B (5 × 4 = 20 Marks)
Answer **ANY FIVE** Questions

		Marks	BL	CO	PO
21.	Differentiate sensors and actuators.	4	4	1	1
22.	Brief about path loss in wireless transmission.	4	2	2	2
23.	Write a note on Bluetooth standard.	4	4	2	1
24.	List out the data service middleware components and explain them shortly.	4	1	4	1
25.	Write short note on S-MAC protocol.	4	4	2	2
26.	Brief on security challenges and security attacks in wireless sensors networks.	4	4	4	2
27.	Brief on the operating systems used for WSN.	4	4	3	1

PART – C (5 × 12 = 60 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
28. a.	Compare wireless sensors networks and traditional networks with suitable diagrams.	12	4	1	1

(OR)

	b.	Discuss about the reasons behind why parallel buses are not desirable in a wireless sensor node.	12	4	1	1
29.	a.	Elaborate the concept of time synchronization with respect to sensor chocks.	12	3	2	1
		(OR)				
	b.	Explain the hardware Telosb and Micaz motes.	12	3	1	1
30.	a.	Describe the overview of wireless MAC protocols and their characteristics.	12	4	2	1
		(OR)				
	b.	Describe the contention based MAC protocols and contention free MAC protocols in wireless sensor networks.	12	4	2	1
31.	a.	Discuss about the design issues in WSN routing, data dissemination and gathering.	12	4	3	2
		(OR)				
	b.	Discuss about any two hierarchical routing protocols designed for wireless sensor networks.	12	3	3	3
32.	a.	Describe the WSN middleware principles with middleware architecture.	12	3	4	3
		(OR)				
	b.	Give the details on the security protocols used for wireless sensor networks.	12	3	4	3

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