28. a.	How does MACAW extend MACA and what is the purpose of the additional control messages?	10	4	3	4
	(OR)				
b.	Outline the advantages and disadvantages of contention-free and contention-based medium access strategies and explain any two best contention based protocols with examples.	10	2	3	1
29. a.	Discuss the cluster head election policy in the LEACH protocol and explain how LEACH can consider the available energy on each node in this election process.	10	2	4	4
	(OR)				
b.	Discuss and summarize the main objectives and routing strategies used in geographical based routing.	10	2	4	1
30. a.	Examine and identify the middleware technologies and explain advantages and disadvantages of each technology with its architecture.	10	2	5	4
	(OR)				
b.	Analyze the attack protocols for security in wireless sensor networks and explain any two protocols based on algorithm models.	10	4	5	4

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Reg. No.														

B.Tech. DEGREE EXAMINATION, NOVEMBER 2022
Sixth/ Seventh Semester

18CSE451T – WIRELESS SENSOR NETWORKS
(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

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** should be answered in answer booklet.

Time: 2½ Hours Max. Marks: 75

PART – A (25 × 1 = 25 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
1.	Residential control system belongs to (A) Category 1 WSNS (B) Category 2 WSNS (C) Point-point network (D) Single hop network	1	1	1	1
2.	The program memory bus and data memory bus accessible from outside the chip is supported in (A) Von Neumann architecture (B) Harvard architecture (C) Super-Harvard architecture (D) All of the mentioned	1	2	1	1
3.	For high bandwidth applications with smaller size the most suited process is (A) Micro controller (B) Application specific integrated circuits (C) Digital signal processors (D) Field programmable gate array	1	1	1	1
4.	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	2	1	1
5.	IEEE 802.11a protocol uses the _____ frequency band. (A) 2.4 GHz (B) 5 GHz (C) 10 GHz (D) Less than 2.4 GHz	1	1	1	1
6.	Which of the following approach uses two signals that travel with different velocities? (A) One-way TOA (B) Two way TOA (C) TDOA (D) Angle of arrival	1	1	2	1
7.	Basic model of radio wave propagation found in WSN is (A) Direct (B) Free space wave (C) Direct or free space (D) None	1	1	2	1
8.	License for frequency bands are given by (A) FCC (B) FIC (C) FC (D) CF	1	1	2	1

9.	What is the data throughput of IEEE 802.11 standard?	1	2	2	2
	(A) 2 to 54 Mbps (B) 2 to 3 Mbps (C) 1 to 2 Mbps (D) 1 Mbps				
10.	What are the examples of fixed assignment in contention based protocol?	1	2	2	2
	(A) FDMA, TDMA and CDMA (B) Polling, token-passing, reservation based (C) ALOHA, CSMA, MACA, MACAW (D) FDMA, TDMA, CDMA, CSMA				
11.	The main goal of the _____ is to reduce energy waste caused by idle listening, collisions, overhearing and control overhead.	1	2	3	2
	(A) S-MAC protocol (B) IEEE 802.15.4 standard (C) Message passing (D) Slotted Aloha				
12.	Which of the following is not a MAC protocol in wireless sensor networks?	1	2	3	1
	(A) Slotted Aloha (B) Polling (C) CSMA/CD (D) CSMD/CA				
13.	_____ is used to propagate one-hop neighbour information among neighbouring nodes.	1	2	3	3
	(A) Network protocol (B) MAC protocol (C) Neighbour protocol (D) Schedule protocol				
14.	Which of the following are performance metric of MAC protocol?	1	2	3	2
	(A) Delay, throughput, robustness, scalability, stability (B) Polling, delay, throughput, robustness, scalability (C) Reservation, pooling, robustness, stability (D) Reservation, throughput, robustness, scalability, stability				
15.	The S-MAC protocol does not include following major components.	1	1	3	1
	(A) Periodic listen and sleep (B) Collision avoidance (C) Overheating avoidance (D) Pattern scheduling				
16.	The objective of WSN routing path selection is to	1	1	4	1
	(A) Maximize energy consumption (B) Maximize the lifetime of the network (C) Minimize the lifetime of the network (D) Minimize the overall number of sensors				
17.	The SPIN belongs to the category of	1	2	4	2
	(A) Flat based routing protocols (B) Hierarchical based routing protocols (C) Location based routing protocols (D) Hybrid routing protocols				
18.	_____ broadcasts packets, but creates loops in the systems.	1	2	4	2
	(A) Forwarding (B) Flooding (C) Back warding (D) None of the above				

19.	APTEEN uses _____ schedule to implement the hybrid network.	1	1	4	1
	(A) FDMA (B) TDMA (C) CDMA (D) SDMA				
20.	The sensor applications data model describes	1	1	4	1
	(A) The flow of information between the sensor nodes and the data sink (B) The flow of information between the sensor nodes (C) The flow of information between the data sinks (D) The flow of information between the WSNs				
21.	What is the other name for object middleware?	1	1	5	1
	(A) Object request interface (B) Object enable interface (C) Object request broker (D) Object enable broker				
22.	Which of the following file is used to register newly created middleware?	1	2	5	2
	(A) Middleware (B) Kernel (C) Config (D) Set middleware				
23.	The software substituted for hardware and stored in ROM is _____.	1	2	5	2
	(A) Synchronous software (B) Package software (C) Firmware (D) Middleware				
24.	CODA is	1	1	5	1
	(A) Transport layer protocol (B) Network (C) Data link (D) Application				
25.	Which of the following is not a strong security protocol?	1	2	5	2
	(A) HTTPS (B) SSL (C) SMTP (D) SFTP				

PART – B (5 × 10 = 50 Marks) Marks BL CO PO

Answer **ALL** Questions

26. a.	Examine and identify the major challenges in WSN and justify your solutions for the four issues.	10	2	1	1
	(OR)				
b.	Identify and categorize the suitable applications for health care and explain with the important key factors to be considered for monitoring the health.	10	2	1	1
27. a.	Examine the existing wireless technologies used for WSN and identity the technology used for commercial purpose and explain with suitable example.	10	2	2	1
	(OR)				
b.	Investigate the difference between external and internal time synchronization and illustrate any one concrete example for each type of synchronizations.	10	3	2	4