**(OR)**

   b. Summarize the challenges and security attacks in WSN's.     12   2   4   2

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**B.Tech. DEGREE EXAMINATION, MAY 2023**
Sixth & Seventh Semester

18CSE451T – WIRELESS SENSOR NETWORKS
*(For the candidates admitted during the academic year 2018-2019 to 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. Identify the category in which the residential control system belongs to    1   1   1   1
   (A) Category 1 WSN           (B) Category 2 WSN
   (C) Point-point network       (D) Single hop network

2. IEEE 802.11 a protocol uses the _____ frequency band.    1   2   1   1
   (A) 2.4 GHz              (B) 5 GHz
   (C) 10 GHz             (D) Less than 2.4 GHz

3. Identify the characteristic of category 1 WSN.    1   1   1   1
   (A) The radio links are measured in thousands of meters
   (B) Sensor nodes can support communications on behalf of other sensor nodes
   (C) The forwarding node supports static routing to the terrestrial network
   (D) The forwarding node supports dynamic routing to the terrestrial network

4. Identify the abilities of WSN    1   1   1   1
   (A) Self-organization, self-optimization
   (B) Self-protection, self-healing, self-resizing
   (C) Self-organization, self-optimization, self-protection, self-healing
   (D) Self-organization, self-optimization, self-protection, self-healing, self- resizing

5. Wireless communication means communication by _____ waves.    1   1   1   1
   (A) Radio               (B) Sound
   (C) Electric             (D) Vacuum

6. Identify the approach that uses two signals that travel with different velocities.    1   1   1   1
   (A) One-way ToA         (B) Two way ToA
   (C) TDoA              (D) Angle-of-arrival

7. What is the full form of SPS?    1   1   1   1
   (A) Standard positioning service     (B) Satellite positioning service
   (C) Spatial positioning service      (D) Station positioning service

8. Which of the following materials cause reflections? `1  1  2  2`
   (A) Metallic      (B) Dielectric
   (C) Metallic and dielectric      (D) Air

9. The S-MAC protocol does not include following major components. `1  1  2  1`
   (A) Periodic listen and sleep      (B) Collision avoidance
   (C) Overhearing avoidance      (D) Pattern scheduling

10. LEACH is a _____ based protocol. `1  2  2  1`
    (A) Star      (B) Clustering
    (C) Area      (D) Packet

11. Which of the following is not a MAC protocol in wireless sensor networks? `1  1  2  1`
    (A) Slotted ALOHA      (B) Polling
    (C) CSMA / CD      (D) CSMA / CA

12. The acceptable BER for data communication is `1  1  1  1`
    (A) $10^{-6}$      (B) $10^{-5}$
    (C) $10^{-4}$      (D) $10^{-2}$

13. MCFA means `1  1  3  1`
    (A) Model centric forwarding algorithm      (B) Minimum cost forwarding algorithm
    (C) Minimum cycle feature algorithm      (D) Maximum cycle feature algorithm

14. _____ routing protocols are using higher energy nodes for transmission and lower energy nodes for sensing. `1  2  3  1`
    (A) Flat based      (B) Hierarchal based
    (C) Location based      (D) Hybrid

15. SOP stands for `1  2  4  1`
    (A) Symmetric operational protocol      (B) Standard operational protocol
    (C) Self operational protocol      (D) Self organizing protocol

16. Identify the message used to advertise new data among nodes is SPIN is `1  1  4  1`
    (A) ADV      (B) REQ
    (C) DATA      (D) MSG

17. The objective of WSN routing path selection is to `1  1  3  2`
    (A) Maximize energy consumption      (B) Maximize the lifetime of the network
    (C) Minimize the life time of the network      (D) Minimize the overall number of sensors in the WSN

18. Which of the following is not a strong security protocol? `1  2  5  2`
    (A) HTTPS      (B) SSL
    (C) SMTP      (D) SFTP

19. Which of the following file is used to register newly created middleware? `1  2  5  2`
    (A) Middleware      (B) Kernel
    (C) Config      (D) Set middle ware

20. What is the other name for object middleware? `1  1  5  1`
    (A) Object request interface      (B) Object enabled interface
    (C) Object request broker      (D) Object enabled broker

## PART – B (5 × 4 = 20 Marks)
Answer **ANY FIVE** Questions    `Marks  BL  CO  PO`

21. List out any four areas of WSN applications. `4  2  1  4`

22. Define microcontroller. `4  2  1  3`

23. Explain the concept of reflection and diffraction. `4  2  2  2`

24. Explain in brief about node localization. `4  3  2  2`

25. Explain the advantages and use of RTS/CTS messages. `4  3  2  2`

26. Explain about flooding with suitable diagrams. `4  1  3  2`

27. List out any two middleware approaches and briefly explain. `4  2  4  2`

## PART – C (5 × 12 = 60 Marks)
Answer **ALL** Questions    `Marks  BL  CO  PO`

28. a. Explain the need of multiple communication hops instead of a single hop in WSNs with suitable diagrams. `12  2  1  1`

   **(OR)**

   b. Discuss about the reasons behind why parallel buses or not desirable in a wireless sensors node. `12  2  1  1`

29. a. Explain in detail about time synchronization and problems associated with synchronization. `12  2  2  2`

   **(OR)**

   b. Explain in detail about Zigbee. `12  2  2  2`

30. a. How does MACAW extend MACA and what is the purpose of the additional control messages? `12  2  2  2`

   **(OR)**

   b. List the advantages and disadvantages of contention-free and contention-based medium access strategies. `12  2  2  2`

31. a. Explain on LEACH protocol with suitable diagrams. `12  2  3  2`

   **(OR)**

   b. Discuss the main objectives and routing strategies used in geographical based routing. `12  2  3  2`