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Reg. No. :

Question Paper Code: 99427

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

Professional Elective

Electronics and Communication Engineering

19UEC927 - SMART SENSOR NETWORKS

(Regulations 2019)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5Marks)

1. The propagation technique in WSN between hops of network can be _____.   CO1-U

    (a) Routing   (b) Flooding   (c) Connecting   (d) Both (a) & (b)

2. Sensing element found in _____.   CO1-U

    (a) Traditional Data networks   (b) WSN   (c) Both (a) & (b)   (d) None of the above

3. SINA is used for_____.   CO1-U

    (a) Querying   (b) Tasking   (c) Event Monitoring   (d) All of the above

4. Connection Establishment between sender and receiver is found in _____
    protocol.   CO1-U

    (a) TCP   (b) UDP   (c) Both (a) & (b)   (d) FTP

5. Bluetooth radio has _____different power consumption modes   CO1-U

    (a) two   (b) four   (c) three   (d) five

PART – B (5 x 3= 15Marks)

6. Determine the various management plane types in WSN architecture.   CO1-U

7. Identify the dynamic programming preferred for sensor networks.   CO1-U

8. Suggest the method to figure out which sensor node contains a faulty
    temperature-sensing device.   CO4-App

9. Identify the factors influencing time synchronization in wireless sensor
    networks.   CO1-U

10. Specify the power consumption modes in Bluetooth radio.   CO1-U

PART – C (5 x 16= 80Marks)

11. (a) Compare and contrast terrestrial and wireless networks. CO1-U (16)

Or

(b) Discuss in detail about sensor network applications in real time environment. CO1-U (16)

12. (a) Assume a sensor network is installed in the northeastern quadrant of the forest to monitor empty bird nests and tell me every hour if the number of empty nests exceeds a threshold of 10. Create a SQL Query for the above scenario and elaborate it. CO3-App (16)

Or

(b) Consider a user who wishes to monitor the occupancy of the conference rooms on a particular floor of a building. She chooses to do this by using microphone sensors attached to motes, and looking for rooms where the average volume is over some threshold (assuming that rooms can have multiple sensors). Illustrate how the query could be expressed in detail with neat diagram. CO3-App (16)

13. (a) Develop a SQTL script for the coordinated vehicle tracking algorithm. CO4-App (16)

Or

(b) Motes are equipped with suitable sensors and deployed across the battlefield to monitor troop and vehicle movement sequence number for the destination of which the source in Battlefield Surveillance system. Develop a middleware-based approach to implement SINA functional architecture for the above scenario for Querying and Tasking. CO4-App (16)

14. (a) Assume that 100 motes with minimum battery lifetime are placed in a crop field which form clusters and transfer the sensor data (temperature, Humidity and moisture level) to sink. Design an energy efficient routing protocol to improve the life time of a wireless sensor network. CO2-App (16)

Or

(b) Address the issues in implementing TCP and UDP in Wireless sensor networks for monitoring the environmental conditions. CO2-App (16)

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15. (a) Reason out why firewalls and honeypots not well suitable for WSN and also discuss some of the security approaches for WSN.   CO1- U   (16)

<div align="center">Or</div>

    (b) Discuss in detail about SPINS protocols suite with neat diagram.   CO1- U   (16)

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