

QUESTION BANK

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

SUBJECT CODE : CL7003
SUBJECT NAME : WIRELESS SENSOR NETWORKS
SEMESTER/BRANCH :II M.E(C&I)
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UNIT I

INTRODUCTION

PART –A

1. What is a Wireless Sensor Network?
2. What are the characteristic requirements of Wireless sensor network?
3. What are the hardware components of a Wireless sensor network?
4. What is Single Hop and Multiple Hop?
5. What are the various roles of the sensor?
6. What is energy efficient routing?
7. Why sensor networks are different?
8. Differentiate between sensor networks and Adhoc networks.
9. Differentiate between sensor networks and MANETS.
10. List out the basic parts of a Wireless Sensor network.
11. Why multihop wireless communication is required for WSN?
12. State the deployment options for WSNs.
13. What are the various operating modes of a transceiver?
14. What are the characteristics of a transceiver?
15. Define Source and Sink.
16. List out the types of sources and sinks.
17. Define mobility.
18. What are the various types of mobility?
19. What is Data-Centric Network?
20. List out the different types of interaction pattern between sources and sinks in WSN

PART-B

1. Explain the various challenges of wireless sensor networks. (16)
2. (i) Discuss the characteristic requirements of WSN. (8)
(ii) Explain the innovative mechanisms to realize the characteristic requirements of WSN.(8)
3. (a) Discuss in detail the Transceiver characteristics and structure. (16)

4. (i) Define the types of Sensors. (6)
(ii) Elaborate on the energy scavenging techniques for sensor nodes. (6)
(iii) Write about the operational states of a sensor node. (4)
5. Explain about energy consumption of sensor nodes in detail. (16)
6. With a neat diagram, Explain the sensor network architecture (16)
7. Explain in detail the design principles of WSN.
8. (a) Write notes on
(i). Dynamic Energy and power management (6)
(ii). TinyOS and nesC (4)
(iii). Programming Models in WSN (6)
9. Write in detail about the communication device in a WSN. (16)
10. Discuss the potential applications of WSN. (16)

UNIT II

PHYSICAL LAYER

PART –A

1. Define the characteristic feature of wireless channel.
2. Define large scale fading and small scale fading.
3. List out the three fundamental modulations.
4. Define modulation and demodulation .
5. Discuss about frequency allocation.
6. Define symbol rate and data rate.
7. What is BER?
8. Define band pass modulation.
9. Discuss wave propagation.
10. State Huygen's principle.
11. What is meant by Doppler Fading?
12. Define Path Loss and Attenuation.
13. State the various applications of channel models.
14. What is meant by AWGN?
15. Define Spread spectrum communication and its types.
16. Discuss about the quality of wireless channels.
17. Mention the measures for improving the channel quality.
18. List out the sources of distortion.
19. Define LOS.
20. Discuss about the choice of modulation.

PART-B

1. Discuss in detail about Radio spectrum and Frequency allocation.
2. How will you transmit data using radio waves?
3. Briefly explain about the sources of distortion.
4. Write short notes on noise and distortion.
5. How will you stochastically capture the behavior of a Wireless Channel?
6. List out the Qualities & properties of WSN.
7. Write short notes on transceiver design characteristics.
8. Discuss in detail about the choice of modulation.
9. Discuss about Energy usage profile in WSN.
10. Briefly explain about power management techniques in WSN.

UNIT III

DATA LINK LAYER

PART –A

1. What are the goals of MAC?
2. List out the schemes of MAC.
3. What are the difficulties of Medium Access in wireless networks?
4. List out the requirements for energy efficient MAC protocols.
5. Define Collision.
6. Define overhearing.
7. Define idle listening.
8. What is meant by schedule based MAC?
9. Define contention based protocol.
10. What do you meant by CSMA?
11. Define ALOHA.
12. Define RTS and CTS.
13. Define Wakeup concept.
14. What are the problems in wake up radio MAC protocols?
15. What is meant by framing and error control?
16. List out the features of link management.
17. List the various approaches of error control.
18. How will you use acknowledgements in different layers?
19. What are the three regions of communication?
20. What are the requirements of link quality estimation?

PART-B

1. Briefly specify IEEE 802.15.4 MAC protocol and explain whether the MAC protocols of 802.11 & Bluetooth be used for WSN? Justify.

2. Elaborate on the requirements of MAC protocols for WSNs.
3. Explain the design approaches and performance of S-MAC protocol.
4. Explain the important classes of MAC protocols.
5. Discuss the PAMAS protocol in detail.
6. Elaborate on the concepts of Energy Efficient Unicast Routing Protocol.
7. Discuss the basics of Position Based Routing Protocol and content-based protocol for WSN.
8. Discuss about the fundamental tasks and requirements of MAC in detail.
9. Explain briefly the Link Layer protocols .
10. Describe in detail about SMACS.
11. Write short notes on error control ,framing, link management.

UNIT IV

NETWORK LAYER

PART –A

1. Define Gossiping.
2. Define random walks.
3. Give some examples for unicast protocols.
4. Define multipath unicast routing.
5. What do you meant by source based tree protocols?
6. List the advantages of multicast.
7. Define Geographic routing.
8. How to combine position knowledge with nodes turning on/off?
9. Define mobile data collectors.
10. What is energy efficient routing?
11. What is data centric routing?
12. Define data aggregation and its categories.
13. What is data centric storage?
14. What are the problems in data centric storage?
15. Define one shot interaction and repeated interactions.
16. What are the issues of higher layer designs?

PART-B

1. Explain energy efficient routing protocol .
2. Explain in detail about the geographic routing .
3. Write short notes on gossiping and agent based unicast forwarding.
4. Discuss in detail about energy efficient unicast.
5. Briefly explain broad cast and multicast.

6. Write short notes on mobile nodes.
7. Explain about data centric routing.
8. Explain in detail about aggregation as an optimization problem.
9. Explain about content based networking.
10. Explain about the various higher layer design issues.

UNIT V

CASE STUDIES

PART –A

1. What are the node level simulators?
2. Define detection.
3. What is meant by tracking?
4. List out the features of IEEE 802.15.4 low rate PAN.
5. What are the requirements of habitat monitoring?
6. What are the implementation issues in disaster monitoring?
7. Define Sensor network platforms .
8. Define the tools used in WSN.
9. What are the various software platforms at Node levels.
10. Define Sensor node hardware.

PART-B

1. List out the various case studies in WSN.
2. Write short notes on Target detection and tracking.
3. Write in detail about Habitat monitoring.
4. Explain briefly about Environmental disaster monitoring.
5. Practical implementation issues in WSN-Explain.
6. Write short notes on IEEE 802.15.4 low rate WPAN.
7. Write notes on node level simulators.
8. Briefly explain about the sensor network programming challenges.
9. Explain in detail the node level software platform .
10. Explain briefly about Sensor node hardware.