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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EC8702 AD HOC AND WIRELESS SENSOR NETWORKS

UNIT 1

AD HOC NETWORKS – INTRODUCTION AND ROUTING PROTOCOLS

2 Mark Questions

- 1.What is an adhoc network?
- 2.Why ad hoc networks are needed?
- 3.Define a wireless sensor networks
- 4..Give the difference between cellular networks and ad hoc wireless networks
- 5.Differentiate between WSNs and MANETS
- 6.What is adhoc wireless internet?
- 7.What are the major issues that are to be considered for wireless internet?
- 8.What are the major advantages of the adhoc wireless internet.?
- 9.What is reply attack? How can it be prevented?
- 10.Define multicasting
- 11.What are the challenging issues in ad hoc network maintenance?
- 12.What is hidden terminal problem?
- 13.List the applications of ad hoc wireless networks.
- 14.List the characteristics of wireless channel.
- 15.List the benefits when deployment of a commercial ad hoc wireless networks compared to wired
- 16.List the issues that affect the design deployment and performance of ad hoc wireless system
- 17.Compare Ad-hoc Networks and Wireless LAN.
- 18.What are the responsibilities of routing protocol?
- 19.What are the major challenges in designing routing protocols?
- 20.Differentiate proactive and reactive protocols. Write examples for each.
- 21.List the characteristics of a routing protocol for ad hoc wireless networks.
- 22.List the major classification of routing protocol for ad hoc wireless network.
- 23.List the classification of routing protocols based on the routing information update mechanism.
- 24.Based on routing information update mechanism how the routing protocols are classified?
- 25.How does energy aware routing work?
- 26.List some examples of table driven routing protocols.
- 27.List the advantages and disadvantages of DSDV routing protocol
- 28.List the advantages and disadvantages of Ad hoc on demand protocol
- 19.List the types of on-demand routing protocols.

PART B

- 1.Explain the design issues in Ad hoc wireless networks(13)
- 2.Discuss in detail about the design challenges in Ad hoc wireless networks
- 3.Explain the hidden and exposed terminals problems with an examples and diagrammatic illustration

4. How medium access protocol for wireless LANs (MACAW) based on multiple collision avoidance protocol (MACA) works? How MACA avoids the problem of hidden terminals? How MACA avoids the problem of exposed terminal problems? Give examples. (8)
5. Illustrate the working of destination sequenced distance vector routing protocol for ad hoc wireless networks with an example and diagrammatic illustrations.
6. Explain the major challenges that a routing protocol designed for ad hoc wireless networks
7. Describe how the packets are transmitted in multiple access collision avoidance protocol.
8. Explain DSDV Protocol and AODV Protocol

UNIT II

1. What is wireless sensor network?
2. What are the components of WSN?
3. Write short notes on memory devices in WSN
4. Define: transceivers in WSN
5. Define: noise figure
6. Write short note on different operational states of transceiver in WSN
7. What are wakeup receivers?
8. Write short notes on traditional concurrency process
9. Draw the structure of layered architecture
10. Is the WSN has auto configuration? Briefly discuss
11. Outline the functions performed by node in a wireless sensor network
12. List some design challenges posed by a sensor networks
13. How mobility of nodes affects the throughput in wireless network?
14. How does a multi hop coordination mechanism work

PART B

1. Explain the transceiver operational states.
2. Explain the three categories of sensor with example.
3. Explain in detail about the single node architecture in wireless sensor networks
4. Discuss about the operation states with different power consumption
5. Briefly explain the different types of mobility with proper diagram.
6. Outline the hardware and software components of a Sensor Node with a block diagram
7. Describe the network architecture of wireless sensor networks with diagrammatic illustration
8. Explain the design and operational challenges of wireless sensor network

UNIT III

1. List the issues of designing a MAC protocol for WSN. or List the main issues in designing a MAC protocol for ad hoc wireless networks
2. List any two suggestions to maximize the lifetime of WSN.

3. Draw the super-frame structure of IEEE 802.15.4
4. How CSMA based MAC protocol for wireless sensor network work?
5. What are the challenges and issues in transport layer protocol
6. Why energy efficiency is important in WSN routing?
7. Define: LEACH
8. What is the mediation device protocol?
9. What are the advantages of Mediation device protocol?
10. What is PAMAS?

PART B

1. Describe in depth about the MAC protocols for wireless sensor networks
2. What is the need of power aware multi-access protocol for defining WSN MAC ? also briefly describes the working model of power aware multi-access signalling protocol
3. Explain: SMAC with necessary diagram
4. Explain about the contention based MAC protocol with scheduling mechanism
5. Draw the network Architecture of the IEEE 802.15.4 MAC protocol and super frame structure
6. Explain the energy efficient routing protocol and its algorithm
7. Explain LEACH protocol with necessary diagram

UNIT IV

1. What is meant by node capture?
2. Differentiate link layer jamming and physical layer jamming
3. What is IP spoofing?
4. List the network security requirements.
5. Differentiate between active attack and passive attack
6. What is Smurf attack?
7. List the Core Reason for Network Security Attacks
8. What is worm hole and blockhole attack?
9. What is Spooing?
10. What is DOS?
11. What is Eavesdropping attack
12. In WSN, the data is flooded in the network. Which IP address is used for flooding ? Is flooding, a unicast / multicast / broadcast ?
13. What is a BGP Hijacking?

PART B

1. Assume that as an attacker, you are planning to propose DoS attack. Write down the steps involved for DoS attack. Explain the effect of DoS attack in WSN
2. What is the need of security for routing protocol? Also, explain the secured routing protocol using SPIN
3. Explain layerwise attack and its solution in detail.

4. Explain the Network layer attack and Transport layer attack
5. Classify the types of attacks and explain the possible solutions for jamming, tampering, black hole attack, Flooding attack
6. Explain the key management Techniques and Procedure

UNIT V

What is meant by state centric programming ?

1. What is Berkeley Motes in WSN?
2. Sensor network programming challenges
3. List the examples of node-level programming tools
4. What is TinyOS
5. List the Applications TinyOS
6. Where Contiki is Used?
7. What are the features of Contiki?
8. What is NS2?
9. What are the features of TOSSIM?
10. What is Cooja?

PART B

1. A researcher defined a new routing protocol for WSN. In order to test the performance of the routing protocol, suggest the best approach such as simulation, emulation or real time implementation which should be cost effective. Justify your answer. **(3)**
 - ii) List out: Programming language name, graphical interface name, animation window name used in NS2. **(3)**
 - iii) Convert the following C code to NS2.


```
int a,b,c ;
a=5;
b=6;
c=a+b.
```
2. Most of the journal papers which are published in network domain are displaying the result from simulation. Why do they include simulation results instead of real time implementation? Justify. **(4)**
 - ii) List out and briefly about any four open simulators which are used for ad hoc network and WSN. **(4)**
 - iii) Analyse the methodology of cycle driven simulation and discrete event simulation.
3. Explain the TinyOS model and its features
4. Explain TOSSIM and its features
5. Explain Contiki operating system and its structure.

