



B.E DEGREE EXAMINATIONS: APRIL 2018

(Regulation 2014)

Eighth Semester

COMPUTER SCIENCE AND ENGINEERING

U14CSTE73: Adhoc and Sensor Networks

COURSE OUTCOMES

- CO1:** Explain the fundamentals of ad hoc and sensor networks.
CO2: Compare the routing protocols of ad hoc networks.
CO3: Illustrate the security issues in ad hoc networks and explain solutions for it.
CO4: Explain the principles of energy management in ad hoc networks
CO5: Summarize the methods for data dissemination and gathering.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match the List I with List II

CO1 [K₁]

List I	List II
A. Bandwidth Efficiency	i. MACAW
B. Contention-Based Protocols	ii. Design issue of MAC Protocol
C. Contention-Based Protocols with Reservation Mechanisms	iii. D-PRMA
D. Contention-based MAC protocols with Scheduling mechanisms	iv. DPS

- | | A | B | C | D |
|----|-----|----|-----|----|
| a) | ii | i | iii | iv |
| b) | iii | iv | ii | i |
| c) | ii | iv | iii | i |
| d) | iii | i | ii | iv |
2. MAC protocols that use directional antennas for transmissions to improve
- | | |
|---------------|-------------|
| a) Throughput | b) Delay |
| c) Jitter | d) Overhead |

CO1 [K₁]

3. Consider the following statements CO2 [K₂]
1. A routing protocol for ad hoc wireless networks should not be fully distributed
 2. The major challenge that a routing protocol designed for ad hoc wireless network faces is mobility of nodes.
 3. Two essential and limited resources that form the major constraint for the nodes in an ad hoc wireless network are battery life and processing power.
 4. The Ad hoc wireless network routing protocols must not optimally manage the resources.
- Which of these statements are correct?
- | | |
|--------|--------|
| a) 1,3 | b) 1,4 |
| c) 1,2 | d) 2,3 |
4. The cluster-head is elected dynamically by employing CO2 [K₂]
- | | |
|---|--|
| a) Least Cluster Head (LCH) algorithm | b) Least Cluster Change (LCC)algorithm |
| c) Minimum Cluster Head (MCH) algorithm | d) Minimum Cluster Change (MCC)algorithm |
5. Assertion (A): Cryptography is one of the most common and reliable means to ensure security CO3 [K₁]
- Reason (R): Cryptography is the study of the principles, techniques, and algorithms by which information is transformed into a disguised version
- | | |
|---|---|
| a) Both A and R are Individually true and R is the correct explanation of A | b) Both A and R are Individually true but R is not the correct explanation of A |
| c) A is true but R is false | d) A is false but R is true |
6. In Blackhole attack, a malicious node falsely advertises to the destination node about CO3 [K₂]
- | | |
|-----------------|---------------|
| a) Good paths | b) Bad paths |
| c) Missed paths | d) Lost paths |
7. Shamir's three-pass protocol working is given by the order CO3 [K₂]
1. Generate K_x
 2. Generate K_y
 3. Encrypt with f
 4. Encrypt with g
- | | |
|------------|------------|
| a) 2-3-4-1 | b) 1-3-2-4 |
| c) 3-4-2-1 | d) 4-1-3-2 |
8. The cell discharge is limited not only by the diffusion process but also by a process called CO4 [K₂]
- | | |
|---------------|----------------|
| a) Initiation | b) Stimulation |
| c) Activation | d) Passivation |

9. Assertion (A): Sensor nodes are randomly deployed and hence do not fit into any regular topology. CO5 [K₂]

Reason (R): Hardware design for sensor nodes should consider energy efficiency

- a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false d) A is false but R is true

10. Gossiping is a modified version of CO5 [K₂]

- a) Broadcasting b) Flooding
c) Polling d) Multicasting

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. Differentiate between IEEE 802.11 and IEEE802.16. CO1 [K₂]
12. State any two design goals of a MAC protocol for Adhoc wireless network. CO1 [K₁]
13. List the categories based on which routing protocols for adhoc networks are classified. CO2 [K₁]
14. Define minimum cost per packet. CO2 [K₁]
15. Compare the external and internal attacks in adhoc networks. CO3 [K₂]
16. Give an example for transposition. CO3 [K₂]
17. Define efficiency of the battery. CO4 [K₁]
18. Name the different states of node in a PAMAS protocol. CO4 [K₁]
19. Compare Wireless Sensor Network with Adhoc Wireless Networks. CO5 [K₂]
20. Mention the basic kinds of MAC protocols used in sensor networks. CO5 [K₁]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. Design an adhoc wireless network for the sudden flood happened in your state considering the routing of data and energy management of the devices. CO1 [K₆]
22. Summarize the features of any two MAC protocols that use directional antennas. CO1 [K₂]
23. (i) Recall the characteristics of routing protocols for ad hoc wireless networks. (7) CO2 [K₁]
(ii) Illustrate the route establishment in DSDV. (7) CO2 [K₂]

24. Construct an architecture reference model for Multicast routing protocols. CO2 [K₃]
25. (i) Explain the issues and challenges in security provisioning of Adhoc Networks. (7) CO3 [K₂]
(ii) Outline the SAR protocol of Adhoc Networks. (7) CO3 [K₂]
26. Develop any two data link layer solutions for transmission power management schemes. CO4 [K₃]
27. Demonstrate how data gathering is done in wireless sensor networks. CO5 [K₂]
