

B.TECH/ECE/7TH SEM/ECEN 4144/2021
AD HOC NETWORKS AND SECURITY
(ECEN 4144)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Nodes must be scheduled in a distributed fashion for gaining access to the channel because
- (a) There is no centralized coordinators
 - (b) Nodes are not communicating with each other
 - (c) Exposed terminal problem
 - (d) Power level of the receiving data is very weak.
- (ii) MAC-By Invitation is an example for
- (a) Sender-Initiated Protocol
 - (b) Receiver-Initiated Protocol
 - (c) Synchronous Protocol
 - (d) Priority Protocol.
- (iii) Multichannel Protocols are example for
- (a) Contention Based Protocol
 - (b) Contention Based Protocol with Reservation Mechanism
 - (c) Contention Based Protocol with Scheduling Mechanism
 - (d) Other MAC protocol.
- (iv) For Byzantine Attack Targeted Layer in the Protocol Stack is-
- (a) Physical and MAC Layers
 - (b) Network Layer
 - (c) Application Layer
 - (d) Multi-Layer.
- (v) Proactive Routing Protocol is
- (a) Distance Vector Routing Protocol
 - (b) Link State Routing Protocol
 - (c) Table Driven Routing Protocol
 - (d) On-Demand Routing Protocol.
- (vi) MACA-BI is a hand-shake mechanism with :
- (a) 3 Steps
 - (b) 4 Steps
 - (c) 2 Steps
 - (d) 5 Steps.
- (vii) The layer that preventing signal jamming denial-of-service attacks?
- (a) Physical Layer
 - (b) Network Layer
 - (c) Link Layer
 - (d) Application Layer.

- (viii) The Transmit Power Level is Controlled to:
(a) Reduce Interference (b) Reduce Pollution of Data
(c) Save Battery (d) All of These.
- (ix) RTR – command stands for:
(a) Ready to Reject (b) Ready to Reply
(c) Ready to Receive (d) Ready to Repeat.
- (x) Ad Hoc Mode of Wireless Network is also known as-
(a) Router (b) Roaming (c) Infrastructure (d) Digital.

Group - B

2. (a) State and explain the differences between Static and Mobile Ad Hoc Network. [(CO1)(Remember/LOCQ)]
(b) How many types of contention based protocols are there? What is the difference between them? [(CO1, CO4)(Understand/LOCQ)]
(c) Explain IEEE 802.11 in Ad Hoc Mode. [(CO1) (Understand/LOCQ)]
3 + 5 + 4 = 12
3. (a) What are the advantages of reservation based MAC protocols over contention based MAC protocols? [(CO4) (Remember/LOCQ)]
(b) State hidden and exposed terminal problem. How those problems can be minimized? [(CO1, CO2) (Analyse/IOCQ)]
(c) How is synchronization between nodes achieved in HRMA protocol? [(CO2)(Analyse/IOCQ)]
3 + 6 + 3 = 12

Group - C

4. (a) What are the difference between pro-active and on-demand routing protocols? [(CO3)(Understand/LOCQ)]
(b) Analyse the design challenges associated with the Ad Hoc routing protocols. [(CO2, CO3)(Analyze/IOCQ)]
(c) How energy aware routing algorithm works? State with proper schematic. [(CO3)(Evaluate/HOCQ)]
2 + 4 + 6 = 12
5. (a) Table driven routing protocol is not an energy efficient scheme. Justify the statement. [(CO3)(Analyse/IOCQ)]
(b) Show how a route is established using DSDV protocol for an Ad Hoc wireless network consisting of 8 nodes. Use node 1 as the source and node 8 as the destination. [(CO2, CO3, CO4)(Create/HOCQ)]
4 + 8 = 12

Group - D

6. (a) What are the design challenges of a transport layer protocol for Ad Hoc networks? [(CO2, CO4) (Analyze/IOCQ)]

- (b) State with an example TCP over Ad Hoc Wireless Networks.
[[CO1, CO5](Remember/LOCQ)]
- (c) How feedback based TCP improves network performance?
[[CO5] (Apply/IOCQ)]

4 + 5 + 3 = 12

7. (a) Analyze the design issues of Transport Layer Protocol for Ad Hoc wireless networks. [[CO2, CO5] (Evaluate/HOCQ)]
- (b) What is the impact of the failure of proxy nodes in split- TCP?
[[CO4, CO5] (Analyze/IOCQ)]
- (c) How feedback based TCP improves network performance? [[CO5] (Apply/IOCQ)]

5 + 3 + 4 = 12

Group - E

8. (a) Why is power aware routing important for Ad Hoc networks? What are the classifications for power aware routing in Ad Hoc wireless networks?
[[CO3] (Analyze/IOCQ)]
- (b) State Denial of Service and small back off window attack.
[[CO5] (Remember/LOCQ)]

(4 + 4) + 4 = 12

9. (a) Battery power management is necessary for efficient network operation. Justify.
[[CO1, CO6](Evaluate/HOCQ)]
- (b) What is sleep mode? How this mode improves power optimization.
[[CO1, CO5](Analyze/IOCQ)]

6 + (2 + 4) = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	27.08%	46.88%	26.04%

Course Outcome (CO):

After the completion of the course students will be able to

CO1. Understand the under lying technologies of wireless networks.

CO2. Analyze the various design issues and challenges of Ad hoc (wireless) Networks.

CO3. Learn different routing protocols and their working.

CO4. Learn and analyze end to end transmission schemes.

CO5. Understand network design strategies and QoS.

CO6. Our students will be able to take up research work in communication domain.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question

Department & Section	Submission link:
ECE	https://classroom.google.com/u/0/w/NDA1Mjk2NDExNjE5/tc/NDYzOTI0NjUyODAz