The LNM Institute of Information Technology

Department: Computer Science and Engineering

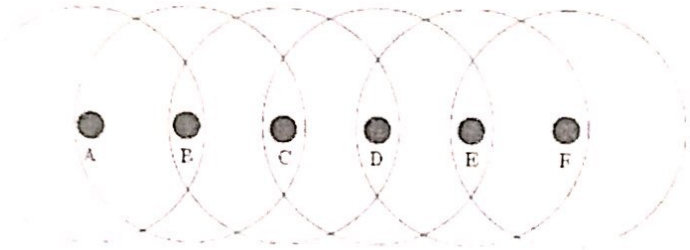
Advanced Computer Networks

Exam Type: End Term

Time: 11:30 AM to 2:30 PM **Date:** 01/05/2019 **Max. Marks:50**

Answer all the following questions.

Q1. (4 marks) Consider the network topology in the below Figure, where circles indicate the communication and interference range of each node, that is, each node can hear the immediate neighbors to the left and right. Assume that RTS/CTS is not being used.



(a) Node B currently sends to node A and node C wants to send to node D. Is node C allowed to do so (i.e., can it do so without causing a collision) and will it decide to do so?

(b) Node C sends to node B and node E wants to send to node D. Is E allowed to do so and will it do so?

(c) Node A sends to node B and node D sends to node C. Which other nodes are allowed to send at the same time?

(d) Node A sends to node B and node E sends to node F. Which other nodes are allowed to send at the same time?

Q2. (3 Marks) Does the NAV field in IEEE 802.11 networks prevent the hidden terminal problem?

Q3. (5 Marks) Discuss the cluster head election policy in the LEACH protocol and explain how LEACH can consider the available energy on each node in this election process. What is the problem with this energy-aware election policy? Further, LEACH uses TDMA within a cluster: explain the advantages and disadvantages of this approach.

Q4. (3 Marks) What are some key characteristics that distinguish third-generation cellular systems from second-generation cellular systems?

Q5. (5 Marks) Draw software defined networks architecture and what are the main differences between the control plane and Data plane in the network.

Q6. (5 Marks) What is cognitive radio? Why should cognitive radio enable to do? Briefly explain all the cognitive radio cycle states.

Q7. (5 Marks) How a Content delivery network improves fairness, efficiency, and stability in HTTP-based adaptive video streaming? Explain in-detail with neat sketch.

Q8. (5 Marks) Write and short notes on IOT and provide its applications.

Q9. (5 Marks) Why IEEE 802.11 MAC is using CSMA/CA mechanism? Design and explain frame structure of IEEE 802.11.

Q10. (10 Marks) Write a short notes on ANY TWO in the following

(a) SPIN

(b) Data Aggrigation

(c) Handoff mechanisms

(d) Spectrum sensing

(e) 2.5G

"Engineers like to solve problems. If there are no problems handily available, they will create their own problems" - **Scott Adams**