

The LNM Institute of Technology, Jaipur
Mid Term Exam Odd Sem (2017-2018)

MM: 50

Computer Networks

Time: 1.5 Hours

PART-B

1. How can a wireless node interfere with the communications of another node when the two nodes are separated by a distance greater than the transmission range of either node? [3 Marks]
2. Assume you are building a CSMA/CD network running at 1Gbps over a 1-km cable with no repeaters. The signal speed in the cable is 200,000 km/sec. What is the minimum frame size? [4 Marks]
3. Suppose a 100-Mbps point-to-point link is being set up between Earth and a new lunar colony. The distance from the moon to Earth is approximately 385,000 km, and data travels over the link at the speed of light— 3×10^8 m/s.
 - a) Calculate the minimum RTT for the link.
 - b) Using the RTT as the delay, calculate the delay \times bandwidth product for the link.
 - c) What is the significance of the delay \times bandwidth product computed in (b)?
 - d) A camera on the lunar base takes pictures of Earth and saves them in digital format to disk. Suppose Mission Control on Earth wishes to download the most current image, which is 25 MB. What is the minimum amount of time that will elapse between when the request for the data goes out and the transfer is finished? [4*2 Marks]
4. Assume we need to design a Selective-Repeat sliding-window protocol for a network in which the bandwidth is 1 Gbps and the average distance between the sender and receiver is 5,000 km. Assume the average packet size is 50,000 bits and the propagation speed in the media is 2×10^8 m/sec. Find the maximum size of the send and receive windows and the number of bits in the sequence number field (m). [7 Marks]