2020

Time: 3 Hours   **Full Mark: 70**

(Answer All Questions and the figures in the right-hand margin indicates marks)

1.
  a) Briefly explain the objectives of computer communication networks and the network components.   [6]
  b) Explain the TCP/IP protocol suite.   [8]

OR

  c) What is the difference between a port address, a logical address, and a physical address?   [5]
  d) Explain the bus type topology and ring type topology networks. Compare their performance.   [4]
  e) What are the advantages of networking in terms of resource sharing, up gradation cost, security, manageability and workgroup applications?   [5]

2.
  a) Define line coding. Describe Unipolar NRZ, Polar NRZ-L, Bipolar AMI and Manchester encoding by applying on the information sequence 101011100.   [8]
  b) Briefly explain how to convert analog signal to digital data by using Pulse Code Modulation (PCM) technique?   [6]

OR

  c) Explain different parameters that affect network performance. What is the length of bit in a channel with propagation speed of 2×10^8 m/s if the channel bandwidth is 20 Mbps?   [8]
  d) What is the result of scrambling the sequence 11100000000000 using following scrambling techniques? Assume that the last non-zero signal level has been positive.   [6]
    i.   B8ZS
    ii. HDB3(The of non-zero pulses is odd after the last substitution)

3.
  a) Define different technique of digital-to-analog conversion. Which of the technique is most susceptible to noise? Defend your answer.   [10]
  b) Define constellation diagram and its role in analog transmission.   [4]

OR

  c) Describe the goal of multiplexing. Explain different multiplexing technique?   [8]
  d) Define Frequency Hopping Spread Spectrum (FHSS) and explain how it achieves bandwidth spreading?   [6]

4.
  a) Briefly explain how circuit-switched networks operate.   [8]
  b) The message 11001001 is to be transmitted using the CRC polynomial x^3+1 to protect it from error. The message that should be transmitted is _____.   [6]

OR

c) Explain virtual-circuit networks. What is the role of address field in a packet traveling through this networks? [10]

d) An error correcting code has the following code word: [4]

00000000   00001111   01010101   10101010   11110000

What is the maximum number of bit error that can be correct?

5.

Distinguish between Go-Back-N ARQ and Selective-Repeat ARQ. Give examples of both protocols by considering sequence field size 3. [14]

OR

a) Briefly describe Carrier Sense Multiple Access with Collision Detection (CSMA/CD). How persistent method can be apply with this protocol? [10]

b) Explain why collision is an issue in a random access protocol but not in controlled access and channelizing protocols. [4]