Full Marks: 70
Time: 3 hours

Question No.1 is compulsory and answer any five Questions from the rest.

1. a. What is the difference between half duplex and full duplex modes of transmission?   [2X10]

    b. Identify the five components of data communications system.

    c. Write the functions of Network layer.

    d. What are the three key elements of a protocol?

    e. Why switching is required in computer networking?

    f. How do guided media differ from unguided media of transmission?

    g. What are the advantages of dividing an Ethernet LAN with a bridge?

    h. What are the classes of addresses as below?

        (i) 237.14.2.1   (ii) 252.5.10.5   (iii) 114.34.2.8   (iv) 14.23.120.8

    i. A pure ALOHA network transmits 200 bits frames on a shared channel of 200 kbps. What is the throughput if the system produces 1000 frames per second?

    j. Explain substitution cipher with an example.

2. a. What are the different addresses used in an internet using TCP/IP protocols? Briefly explain each of them.   [6]

    b. Name the four basic network topologies and give an advantage of each.   [4]

3. a. Explain the Unipolar, and Bipolar scheme of line coding? How does block coding improve the performance of line coding.   [6]

    b. Describe a multiplexing technique, which is applied, when bandwidth of a link is greater than the combined bandwidth of the signals to be transmitted.   [4]

4. a. Describe framing used in data link layer and its requirements.   [4]

    b. Explain the stop & wait protocol with the help of neat diagram and algorithm.   [6]

5. a. Explain the slotted ALOHA protocol for multiple access. How does it differ from pure ALOHA protocol?   [6]

    b. Give a comparison of TDMA and CDMA.   [4]

6. a. Describe how fast Ethernet is implemented at the physical layer. [6]
        Show the encoding scheme for two UTP category 5 and two fibers.

    b. Describe classless addressing used in IPv4 protocol. [4]

7. a. Describe different types of cipher used in cryptography with suitable [7]
        example. Discuss their relative advantages and disadvantages.

    b. Differentiate between symmetric key and unsymmetric key used in [3]
        cryptography.

8. Write short notes on any two [5X2]

    a. Frequency Shift Keying

    b. Firewall

    c. HTTP & FTP

    d. Line and Block coding