VIT
Vellore Institute of Technology

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

CAT – 1

CSE 1004 – Networks and Communication

Course Name: B.Tech   Slot: D1   Max. Marks: 50

Answer ALL Questions (5 * 10 = 50)

1a. For each of the following four networks, mention the consequences if a connection fails. (4)

    a. Five devices arranged in a mesh topology
    b. Five devices arranged in a star topology (not counting the hub)
    c. Five devices arranged in a bus topology
    d. Five devices arranged in a ring topology

b. Distinguish between port address, logical address and a physical address. Identify the layer functionality for the following services: (6)
    i) Provides independence from differences in data representation
    ii) Error Correction and retransmission
    iii) Ensures reliable transmission of data

2.a. Let us assume that Ccomputer S sends a message to Computer D via LAN1, router R1, and LAN2. Depict this scenario as a diagram. Show the contents of the packets and frames at the network and data link layer for each hop interface. (6)
  b. Discuss the need for protocols and standards. (4)

3.a. What are the factors that affect network performance? (4)
  b. Given the data word 1010011110 and the divisor 10011, (6)
    i. Show the generation of the code word at the sender site (using binary division).
    ii. Show the checking of the code word at the receiver site (assume no error).

4. Let us assume the scenario that transmitting the data directly between two servers 6,000 km apart through a geostationary satellite situated 10,000 km from Earth exactly between the two servers. The data enters this network at 100Mb/s. (10)
    i) Find the propagation delay if data travels at the speed of light (2.3×10^8 m/s).
    ii) Find the number of bits in transit during the propagation delay.

5. A sender needs to send the four data items 3456, ABCC, 02BC, and EEEE (Data are in Hex). Answer the following: (10)
    i. Find the checksum at the sender site.
    ii. Find the checksum at the receiver site if there is no error.
    ii. Find the checksum at the receiver site if the second data item is changed to ABCE.
    iv Find the checksum at the receiver site if the second data item is changed to ABCE and the third data item is changed to 02BA.
    v. What kind of arithmetic is used to add data items in checksum calculation?