Fifth Semester B.E. Degree Examination, June/July 2014
Computer Networks – I

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
atleast TWO questions from each part.

PART – A

1 a. What is data communication? What are its four fundamental characteristics? With a neat diagram, explain the components of data communication system. **(08 Marks)**

    b. Assume that five devices are connected in a mesh topology. How many cables are needed? How many ports are needed for each device? **(02 Marks)**

    c. With a neat diagram, explain the functionalities of each layer of OSI reference model. **(10 Marks)**

2 a. Explain the different causes for transmission impairments during signal transmission through media. **(06 Marks)**

    b. Define bandwidth. A periodic signal has bandwidth of 20 Hz. The highest frequency is 60 Hz. What is the lowest frequency? Draw the spectrum, if signal contains all frequencies of same amplitude. **(04 Marks)**

    c. What is line coding? Describe and represent the information sequence '101000110' using Biphase and Bipolar schemes. **(10 Marks)**

3 a. What is multiplexing? With neat diagram, explain FDM. **(06 Marks)**

    b. What is spread spectrum? Explain with an example direct sequence spread spectrum. **(06 Marks)**

    c. With a neat diagram, explain how message can be sent from one system to another using datagram networks. **(08 Marks)**

4 a. Define hamming distance. Explain simple parity check code C(5, 4) with d_{min} = 2. How many bits can be corrected? **(06 Marks)**

    b. Find the code word c(x), using CRC for the information $d(x) = x^3 + 1$ with generator polynomial $t(x) = x^3 + x + 1$. **(08 Marks)**

    c. Explain with an example. The computation of internet checksum. List the steps undertaken by the sender and receiver for error detection. **(06 Marks)**

PART – B

5 a. Why bit stuffing and byte stuffing are needed? Explain them, with examples. **(06 Marks)**

    b. With neat figures, explain briefly: i) Go–back n ii) selective repeat ARQ protocols. **(10 Marks)**

    c. Explain the frame format of PPP protocol. **(04 Marks)**

6 a. Describe CSMA/CD protocol, with neat flow diagram. **(06 Marks)**

    b. What is channelization? Explain CODE division multiple access, with an example. **(08 Marks)**

    c. Discuss 802.3 MAC frame format and frame length. **(06 Marks)**

7 a. Explain the different types of addressing mechanisms in IEEE 802.11. **(06 Marks)**

    b. With neat diagram, explain layers of Bluetooth. **(06 Marks)**

    c. What is a bridge? Explain with an example the bridge learning and forwarding process of transparent bridge. **(08 Marks)**

8 a. Explain the following fields in IPV4 packet header :
      i) Identification   ii) flags   iii) fragmentation offset. **(06 Marks)**

    b. What is NAT? How can NAT help in address depletion with a neat diagram? **(06 Marks)**

    c. What is the need to change from IPV4 to IPV6? Write IPV6 basic header and describe its fields. **(08 Marks)**

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