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06CS/IS55

Fifth Semester B.E. Degree Examination, June/July 2011
Computer Networks – I

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Explain the fundamental characteristics of a data communication system. **(06 Marks)**
b. What is a physical topology? Describe the four basic topologies. **(08 Marks)**
c. Assume that fifty devices are arranged in a mesh topology. How many links are needed? How many ports are needed for each device? **(06 Marks)**

2 a. What are the propagation time and the transmission time for a 5–Mbyte message if the bandwidth of the network is 1 Mbps? Assume that the distance between the sender and the receiver is 12,000 km and that light travels at 2.4×10^8 m/s. **(06 Marks)**
b. Represent the bit sequence "01001011" using Bipolar schemes AMI and pseudoternary. Explain their characteristics with regard to synchronization and DC component. **(08 Marks)**
c. Explain a PCM encoder. **(06 Marks)**

3 a. Describe the different transmission modes. **(08 Marks)**
b. An analog signal has a bit rate of 8000 bps and a baud rate of 1000 baud. How many data elements are carried by each signal element? How many signal elements do we need? **(06 Marks)**
c. List the multiplexing techniques. Explain the concept of multiplexing using frequency. **(06 Marks)**

4 a. Define FHSS and explain how it achieves bandwidth spreading. **(06 Marks)**
b. Find the codeword, using CRC given data word "1001" and generator "1011". **(08 Marks)**
c. Describe the propagation modes in an optical fiber. **(06 Marks)**

PART – B

5 a. Describe a stop–wait protocol with ARQ. **(10 Marks)**
b. Why bit stuffing and byte stuffing are needed? Explain them with examples. **(10 Marks)**

6 a. Describe the frame format of PPP. **(06 Marks)**
b. A pure ALOHA network transmits 200–bit frames on a shared channel of 200 kbps. What is the throughput if the system produces 1000 frames per second? **(06 Marks)**
c. Describe CSMA /CA protocol with a neat flow diagram. **(08 Marks)**

7 a. Describe 802.3 MAC frame. **(10 Marks)**
b. Describe Bluetooth architectures. **(06 Marks)**
c. How does a VLAN reduce network traffic? **(04 Marks)**

8 a. Describe frequency reuse, handoff and roaming concepts in cellular telephony. **(06 Marks)**
b. Describe STS–1 frame. **(08 Marks)**
c. Describe the concept of asynchronous TDM. **(06 Marks)**

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