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Fifth Semester B.E. Degree Examination, June 2012

Computer Networks – I

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. What is data communication? What are the four important fundamental characteristics? (06 Marks)
 b. What is a protocol? Briefly explain its key elements. (05 Marks)
 c. Explain the responsibilities of transport layer in OSI reference model. (09 Marks)
- 2 a. Define bandwidth. A periodic signal has bandwidth of 20Hz. The highest frequency is 60Hz. What is the lowest frequency? Draw the spectrum if the signal contains all frequencies of the same amplitude. (04 Marks)
 b. Calculate the Shanon channel capacity in the following cases :
 i) Bandwidth = 20 kHz $SNR_{dB} = 40$; ii) Bandwidth = 200 kHz $SNR_{dB} = 6$. (06 Marks)
 c. Define line coding. Describe unipolar NR2, polar NR2-L, bipolar AMI and Manchester encoding by applying on the information sequence 101011100. (10 Marks)
- 3 a. An analog signal has a bit rate of 8000 bps and a band rate of 1000 band. How many data elements are carried by each signal element? How many signal elements do we need? (05 Marks)
 b. Explain phase modulation with a neat diagram. (05 Marks)
 c. What is time division multiplexing? Explain how statistical TDM overcomes the disadvantages of synchronous TDM. (10 Marks)
- 4 a. Briefly explain the coaxial cable and optical fiber with their applications. (08 Marks)
 b. Find the codeword, using CRC given data word “1001” and generator “1011”. (06 Marks)
 c. What is internet checksum? With an example list the steps undertaken by the sender and receiver for error detection. (06 Marks)

PART – B

- 5 a. Explain selection repeat ARQ with neat diagrams. (08 Marks)
 b. What is piggybacking? List its usefulness. (04 Marks)
 c. Explain the frame format and transitional phases of point-to-point protocol. (08 Marks)
- 6 a. 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)
 b. With a neat diagram explain CSMA/CD protocol. (08 Marks)
 c. Explain the MAC sublayer of gigabit Ethernet (06 Marks)
- 7 a. Explain the architecture of IEEE 802.11. (08 Marks)
 b. Differentiate between repeater and amplifier. (02 Marks)
 c. How does a VLAN reducer network traffic? (04 Marks)
 d. Differentiate between bus backbone and star backbone. (06 Marks)
- 8 a. Explain in detail, the architecture of a SONET system. (10 Marks)
 b. Give the architecture of ATM. Show how VPs and VCs are established. (06 Marks)
 c. Write a short note on AMPS. (04 Marks)