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**Fifth Semester B.E. Degree Examination, December 2010**  
**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? List and explain the five components of a data communication system, with examples. (07 Marks)
- b. Discuss the ISO – OSI layered model, bringing out the functionalities of each layer. (10 Marks)
- c. Define the key elements of a protocol. (03 Marks)
- 2 a. An analog signal has a bandwidth of 40 kHz. If we use four levels in the signal, what is the minimum bandwidth of the digital signal? (04 Marks)
- b. What is the Nyquist sampling rate for each of the following signals?
  - i) A low pass signal with bandwidth of 200 kHz.
  - ii) A band pass signal with bandwidth of 300 kHz, having lowest frequency of 200 kHz. (04 Marks)
- c. Write a descriptive note on the three causes of transmission impairments. (12 Marks)
- 3 a. What is time division multiplexing? Explain how statistical TDM overcomes the disadvantages of synchronous TDM. (08 Marks)
- b. An analog signal has a bit rate of 10000 bps and bandwidth of 2000 band. How many data elements are carried by each signal element? How many signal elements do we need? (04 Marks)
- c. Explain phase shift keying, in detail. (08 Marks)
- 4 a. What is reflection? Briefly explain the fibre optic cable media, with a neat sketch. (08 Marks)
- b. Draw a CRC encoder and decoder for CRC code with C (7, 4). Also explain how this CRC design works, with an example. (10 Marks)
- c. Define line of sight propagation. (02 Marks)

**PART – B**

- 5 a. List the protocols for noisy channels. Explain stop and wait protocol for noiseless channels. (08 Marks)
- b. Define piggybacking and its usefulness. (04 Marks)
- c. Write explanatory notes on the different phases of PPP. (08 Marks)
- 6 a. Describe the different controlled access methods. (10 Marks)
- b. Explain 802.3 MAC frame format and frame length. (10 Marks)
- 7 a. Discuss the 802.11 MAC layer frame format. (08 Marks)
- b. Differentiate bus back – bone from star back – bone. Explain each in detail. (10 Marks)
- c. Differentiate between amplifier and repeater. (02 Marks)
- 8 a. Explain in detail, the architecture of a SONET system. (10 Marks)
- b. Write a note on byte interleaving. (04 Marks)
- c. Give the architecture of ATM. Show how VPs and VCs are established. (06 Marks)

