

**TRIBHUVAN UNIVERSITY**  
**FACULTY OF MANAGEMENT**

Office of the Dean  
**2008**

**Full Marks: 40**  
**Time: 2 hrs.**

**BIM/ Second Semester/ITC 214: Data Communication and Computer Network**

*Candidates are required to answer the questions in their own words as far as practicable*

**Group 'A'**

**Answer ALL questions.**

**1. Brief Answer Questions:**

**[10×1=10]**

- i. If a spectrum of signal is 2.03 KHz to 3.75 MHz. Find the bandwidth occupied by the signal.
- ii. Write down the advantages of digital transmission over analog transmission.
- iii. Mention the main implementation areas of packet switching network and circuit switching network in real life.
- iv. If every node is connected to every other node within a LAN. What type of topology is this?
- v. Write about Shannon's Channel Capacity theorem.
- vi. What is piggy backing? Why is it used?
- vii. What are the phases that can be seen in connection oriented service provided by the data link layer?
- viii. What is the major difference between bit rate and baud rate?
- ix. What is persistent CSMA?
- x. What do you mean by the term 'Token' in IEEE 802.4 and IEEE802.5 standard.

**Group 'B'**

**Attempt any FIVE questions:**

- 2) a. Draw the diagram of the communication model and describe the function of each block. **[3]**  
b. Encode the bit stream 101001 using **[3]**
  - i) Manchester Encoding.
  - ii) PSK
  - iii) NRZ-I
- 3) a. What are the benefits of layering in communication architecture (list out only)? Explain briefly the major functions of data link layer, network layer and transport layer of OSI model. **[3]**  
b. What is the virtual circuit switching approach? How is it different from datagram approach? **[3]**
- 4) a. Draw the diagram of TCP/IP and list out the protocols associated with the layers. **[3]**  
b. What is ALOHA? Explain the different types of ALOHA that you know. **[3]**
- 5) a. What is the maximum theoretical data rate of a channel if you are said that the bandwidth is 1.78 KHz and the signal to noise ratio is 25. **[3]**  
b. What is routing? State the major difference static routing and dynamic routing. **[3]**
- 6) a. What is Bridge? How does it differ from a switch?  
b. What is framing? List the different framing techniques you know and illustrate character count method with appropriate examples and diagrams. **[3]**
- 7) a. The message sequence is 11001101 and generator polynomial  $G(X) = x^3 + x + 1$ . Calculate the transmitted frame. **[3]**  
b. Differentiate between: **[3]**
  - i) TDM and FDM
  - ii) TCP and UDP