CS-09

ADCA / MCA (II Yr)

Term-End Examination

December, 2008

CS-09 : DATA COMMUNICATION AND NETWORKS

Time : 3 hours *Maximum Marks : 75*

Note :

(i) Question number 1 is ***compulsory.***

(ii) Answer any ***three*** *questions from the rest.*

1. (a) Assume a signal is sent on 3 KHz channel. Calculate the maximum data rate in the following situations : 5

(i) Signal is binary and channel is perfectly noiseless.

(ii) S/N Ratio in channel is 30 dB.

(b) Explain the use of horizontal and vertical parity bit in error detection and error correction codes, using an example for each. 5

(c) Explain the constellation diagram of PSK modulation over ordinary PSK. 5

(d) Why is circuit switching preferred over packet switching in voice communication ? Also, state the motivation for using packet switching in data network. 5

(e) Explain the mechanisms for congestion control in transport layer. 5

(f) Calculate the CRC for bit sequence 1101011011 and generator polynomial is 10011. 5

2. (a) How are collisions handled in Ethernet protocol ? 5

(b) Why are both virtual path and virtual circuit used in ATM and how are they switched ? 5

(c) Explain the concept of IP Subnetting and Supernetting, using an example for each. 5

3. (a) Answer the following questions with respect to token ring protocol : 6

(i) How is start and end of a frame detected ?

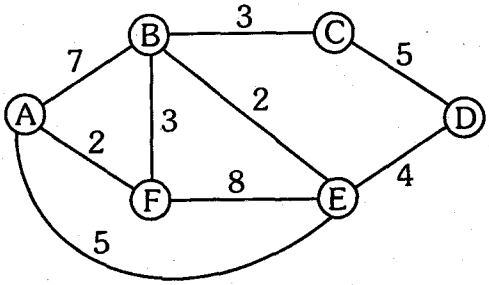
(ii) What is the role of a token, monitor, priority and reservation in access control bits ?

(b) Sketch the Manchester and Differential Manchester encoding for the following bit stream : 4

1101011110110

(c) Why does HDLC use bit stuffing ? Also, explain why point-to-point protocol uses character stuffing rather than bit stuffing. 5

4. (a) Consider the following network and given link cost. Find shortest path from node A to node D using Dijkstra's algorithm. 7



(b) How do FDDI and IEEE 802·5 differ ? Explain the operation of FDDI and its priority scheme. 6

(c) Explain the use of 'fragmentation flags' (IP datagram) in fragmentation process. 2

5. (a) Differentiate between the following : *9*

(i) 100 Base F and 100 Base T cable

(ii) X·25 frame layer and ATM

(iii) 1-persistent CSMA and Non-persistent CSMA

(b) Explain the use of following TCP header fields : *6*

(i) Sequence number

(ii) Urgent pointer

(iii) Window size