MCA (Revised)

Term-End Examination

December, 2007

MCS-042 : DATA COMMUNICATION AND COMPUTER NETWORKS

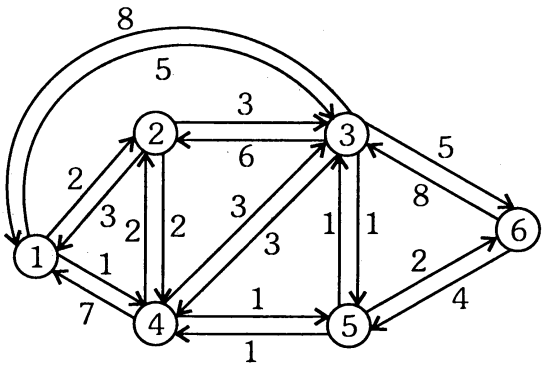
Time : 3 hours *Maximum Marks : 100*

Note : *Question number 1 is* ***compulsory****. Attempt any* ***three*** *questions from the rest.*

1. (a) Give the differences between Broadcast network and Switched network. *3*

(b) What is the required bandwidth of a low pass channel to transmit 1 mbps by baseband communication ? *3*

(c) Consider the following network with the indicated link cost. Use Dijkstra's shortest path algorithm to compute shortest path from source node 1 to all network nodes. *10*



(d) To send data 3 bits at a time at a bit rate of 3 mbps, if the carrier frequency is 10 MHz, find number of levels, baud rate and bandwidth. 5

(e) A network using CSMA/CD has a bandwidth of 10 mbps. If the maximum propagation time is 25·6 μs, what is the minimum size of the frame ? 4

(f) Describe briefly RSA algorithm. 5

(g) Describe briefly Manchester encoding technique. 5

(h) Name two services defined by IEEE 802·11. Distinguish between adhoc N/W and infrastructure network. 5

2. (a) Explain how Link State Routing overcomes the problem of Count-to-Infinity for Distance Vector Routing algorithm. 5

(b) Explain TCP Segment Header format fields. Also draw the Header format. 10

(c) Draw Constellation pattern for 4 PSK. 5

3. (a) Differentiate between Radio communication and Satellite communication in respect of Frequency range, Cost, Installation, Attenuation and EMI sensitivity. 5

(b) Explain pipelining and its use with an example and suitable diagram. 10

(c) Draw pulse diagram for NRZ-L, NRZ-I and RZ for the following bit stream. 5

001100110011

4. Differentiate between the following : *20*

(i) Leak Bucket Traffic Shaper and Token Bucket Traffic Shaper

(ii) Distance Vector Routing and Link State Routing

(iii) Congestion Control and Flow Control

(iv) TCP and UDP

5. (a) A PURE ALOHA network transmits 200 bits frames on a shared channel of 200 kbps. What is the requirement to make this frame collision free ? *5*

(b) Explain how Nagle's algorithm reduces the wastage of bandwidth. *10*

(c) Find CRC for data polynomial $x^4 + x^2 + x + 1$ with generator polynomial $x^3 + 1$. *5*