

MCA (Revised)
Term-End Examination
December, 2007

**MCS-042 : DATA COMMUNICATION AND
COMPUTER NETWORKS**

Time : 3 hours

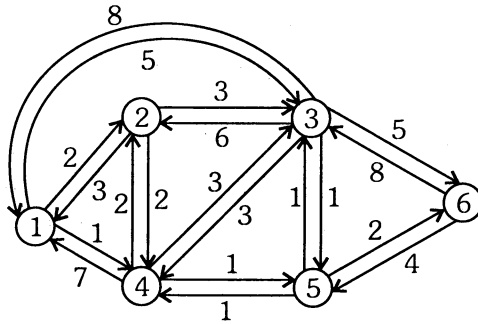
Maximum Marks : 100

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 $25.6 \mu\text{s}$, 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

