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M. Tech 3rd Semester Examination

Computer Communication Networks

EC-303

**Time : 3 Hours**   **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt any five questions.

1. (a) Sketch the OSI model. Describe the purpose of each layer.   (10)

   (b) Consider two hosts A and B connected by a single link of rate r bits/sec. The two hosts are separated by d meters. Signal propagation is p meters per second. Host A is sending to host B a packet of size S bits. What is the propagation delay? What is the transmission delay?   (10)

2. (a) Briefly describe circuit switching, message switching, and packet switching. What is the main advantage of packet switching over message switching?   (10)

   (b) Identify five characteristics of fibre optic cable that make it more suitable for high speed digital transmission than copper cables.   (10)

3. (a) Compare using graphics Stop and Wait and Sliding Window flow control mechanisms when transmitting frames across the link.   (10)

(b) For the six node network topology given below with link costs as shown, find the shortest path from node A to node F using Dijkstra's algorithm. Clearly describe the order of links as they are added one-by-one by the algorithm and give the path cost from node A to the added node. (10)
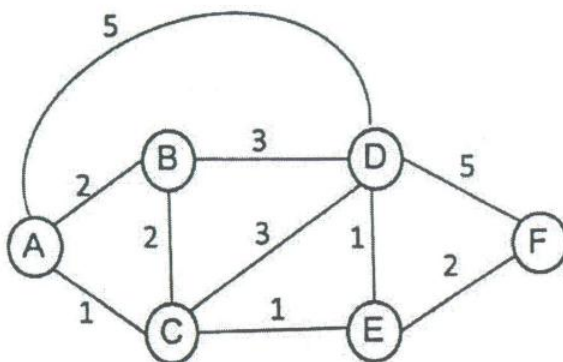
4. (a) What are the criteria for a good routing algorithm? Describe at least five major criteria. (10)

(b) Define DQDB protocol. How does it offer higher reliability than token ring protocol? (10)

5. (a) There are two ways to terminate a TCP connection, what are they? What are the implications (that is, what happens) of each way? (10)

(b) "A datagram cannot be larger than the MTU of a network over which it is sent." Is the statement true or false? Explain with the help of a suitable example. (10)

6. (a) Explain how TCP achieves reliable data transfer over a network even if errors occur during the transmission. (10)

(b) What are Passive Attacks? Why are they difficult to detect? Name some passive attacks. (10)

7. (a) Within the context of an ATM network, explain what the difference is between constant bit rate (CBR) and available bit rate (ABR) traffic. (10)

(b) Why is DNS server needed? What is the advantage of using abbreviations in DNS? (10)

3. (a) Write short note on the following:

(i) SMTP

(ii) Narrowband ISDN

(iii) MD5

(iv) Mobile adhoc networks. (10)

(b) Define simulation. Explain various features related to routing in NS2 simulator. (10)