

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3049

Roll No.

--	--	--	--	--	--	--	--	--	--

B.Tech.

EIGHTH SEMESTER EXAMINATION, 2004-2005

DATA COMMUNICATION NETWORK

Time : 3 Hours

Total Marks : 100

Note : (i) *Attempt ALL questions.*

(ii) *Make and state realistic assumptions if necessary.*

1. Attempt **any four** parts of the following : (5x4=20)

- (a) Explain Frame Relay and ATM technologies with their Data Link control frame formats.
- (b) What is protocol? Explain its elements. Define important characteristics of any protocol.
- (c) Discuss salient features of OSI reference model.
- (d) What are the features of PPP? How lines are brought up and down in it?
- (e) Consider an error free 64 Kbps satellite channel used to send 512 byte data frames from one earth station to another. The satellite is a simple repeater without memory. Earth station to earth station propagation delay is 270mS. Short acknowledgements are generated immediately after a frame is correctly received. What are the maximum throughputs for window sizes of 1, 7, 15 and 127 frames?

- (f) Distinguish between data rate and baud rate. Can you give examples where baud rate is (a) higher (b) lower than the data rate ? Explain.

Attempt **any four** parts of the following : (5x4=20)

- (a) Explain the concept of broadcast channels. What are their design issues ? Do all networks use them ? Give examples.
- (b) An Ethernet channel with many stations has data rate = 10Mbps, fixed size frames 1500 bytes long (unusual), diameter = 1km and signal propagation speed 2×10^8 m/s. Find its maximum channel efficiency.
- (c) In a slotted ALOHA channel 10% of the slots are idle. Calculate the channel load and efficiency.
- (d) Explain limited contention protocol with an example. What are its advantages over full contention and collision free protocols ? Are they used in "Internet" for connecting two international gateways ?
- (e) With k-stations contending for access of a broadcast channel prove that the maximum probability of successful transmission is $\left[\frac{K-1}{K} \right]^{K-1}$ when all stations are similar.
- (f) Discuss the significance of persistence in CSMA protocols.

3. Attempt **any two** parts of the following : (10x2=20)
- (a) Explain the frame format for IEEE 802.3 protocol. Write down the specifications of 100 Mbps Fast Ethernet specified under 100 Base-X and 100 Base-T4. What are the Band rates in different versions/parts of Ethernet ?
 - (b) Describe the salient features of IEEE 802.5 and FDDI. What are their application areas ?
 - (c) Explain the different aspects of medium access in IEEE 802.11. Do they differ in 802.11 b and 802.11 g ? Why 802.11 frame format has four address fields ?
4. Attempt **any two** parts of the following : (10x2=20)
- (a) Explain Network layer design issues in detail.
 - (b) What is routing ? Explain in detail Link-State routing algorithm.
 - (c) Give the IPv 4 header format and explain the significance of each field with their applications. Which fields are rarely utilized ? State some common options. Are they all practical ?
5. Attempt **any two** parts of the following : (10x2=20)
- (a) How connection is established and released in TCP protocol ? What are the different situations that may be encountered ?
 - (b) Discuss the issues and implementation of TCP transmission policy. What is Nagle's Algorithm ? What are the associated congestion control method ?

(c) Write short notes on any two :

(i) UDP

(ii) RTP

(iii) RPC