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No. of Printed Pages—3 EC–802

B. TECH.

EIGHTH SEMESTER EXAMINATION, 2003-2004

DATA COMMUNICATION NETWORK

Time : 3 Hours *Total Marks : 100*

Note : Attempt ALL questions.

1. Attempt any *FOUR* parts of the following :— **(5×4=20)**

(a) What are the two reasons for using layered protocols ?

(b) List two advantages and two disadvantages of having international standards for network protocols.

(c) If a binary signal is sent over a 3 kHz channel whose signal-to-noise ratio is 20 dB, what is the maximum achievable data rate ?

(d) What are the differences between Baseband and Broadband coaxial cable transmission mediums ?

(e) How are the bits of physical layer grouped into frames ?

(f) Describe how PPP handles error detection and how it allows IP addresses to be negotiated at connection time.

2. Attempt any *FOUR* parts of the following :— **(5×4=20)**

(a) Describe the concepts of pure ALOHA and slotted ALOHA systems.

(b) Graphically represent the comparison of the channel utilization versus load for various random access protocols (i.e. pure ALOHA,

120

stotted ALOHA, l-persistent CSMA, 0·5-persistent CSMA and non-persistent CSMA).

(c) What are the basic strategies for channel acquisition in a cable network ? Describe the working principle of limited contention protocols.

(d) Briefly describe the carrier sense multiple access with collision detection protocol.

(e) Describe the interfaces that are used in CDPD.

(f) What is the adaptive tree walk protocol ? Also describe its working principle.

3. Attempt any *TWO* parts of the following :— **(10×2=20)**

(a) Find out the baud rate of the standard 10–Mbps IEEE 802·3 LAN. Also sketch the encoding for the bit stream 0001110101.

(b) Briefly describe the connections of two bridges, using IEEE 802·4 LAN and 802·5 LAN. The first bridge is faced with 1000512-byte frames per second and second bridge is faced with 2004096-byte frames per second.

(c) Describe the operations of transparent and spanning tree bridges of IEEE 802·3 LAN.

4. Attempt any *TWO* parts of the following :— **(10×2=20)**

(a) How does the routing algorithm decide and perform the routing of packets from the source machine to the destination machine ? Also describe the optimality principle.

(b) What are the causes due to which size of packets is imposed to a limited size ? Also describe the transparent and non-transparent fragmentations.

(c) Write short notes on the following :—

(i) Choke packets

(ii) Internetworking

5. Attempt any *TWO* parts of the following :— **(10×2=20)**

(a) Describe establishing a connection element of transport protocols. Also, describe the problems occurred when the network can lose store and duplicate packets.

(b) How are the connection establishment and release managed by transport protocols while they are in use ?

(c) Explain the TCP transmission policy. Also describe the silly window syndrome and congestion window.

