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Computer Networks

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Assignment 10

Problem 31 (4 points)**:**
Consider three LANs interconnected by two routers, as shown in the diagram in problem 12 on page 475 of the Computer Networking book.

(a) Redraw the diagram and assign IP addresses to all of the interfaces. For LAN 1 use addresses of the form 111.111.111.xxx, for LAN 2 use addresses of the form 122.222.222.xxx, and for LAN 3 use addresses of the form 133.333.333.xxx. (1 point)

(b) Include adapters in the diagram and assign a LAN address to each of them. (1 point)

(c) Consider sending an IP datagram from host A to host F. Suppose all of the ARP tables are up-to-date. Enumerate all the steps as done for the single-router example in Section 5.4.2. (2 points)

Problem 32 (1 point)**:**
Illustrate the format of a bridge protocol data unit (or BPDU) as specified in IEEE 802.1d. (Hint: it contains 12 fields.)

Problem 33 (2 points)**:**

(a) At which clock rate (in MHz) does 10BaseT Ethernet have to operate to ensure a maximum throughput of 10 Mbps? (1 point)

(b) At which clock rate does 100BaseT Ethernet have to operate to ensure a maximum throughput of 100 Mbps? (1 point)

Problem 34 (2 points)**:**
Consider the CSMA/CA protocol and suppose that all hosts are perfectly synchronized (i.e. everybody sends its RTS, CTS, data, and ACK packet at the same time). Explain why in this case CSMA/CA can avoid collisions of data packets and acknowledgements. How about the general case, i.e. non-synchronized nodes?

Problem 35 (1 point)**:**
Which organization is responsible for the HDLC standard? Illustrate the format of a standard HDLC frame.