Q13-9. What are the advantages of dividing an Ethernet LAN with a bridge?

Q13-10. What are the common Fast Ethernet implementations?

13.7.3 Problems

P13-1. What is the hexadecimal equivalent of the following Ethernet address?

```
01011010 10000001 01010101 00010001 10101010 00011111
```

P13-2. How does the Ethernet address 1A:2B:3C:4C:5E:6E appear on the line in binary?

P13-3. What is the ratio of useful data to the entire packet for the smallest Ethernet frame?

P13-4. Suppose the length of a 10Base5 cable is 2500 m. If the speed of propagation in a thick coaxial cable is 200,000,000 m/s, how long does it take for a bit to travel from the beginning to the end of the network? Assume there is a 10 μs delay in the equipment.

P13-5. Suppose you are to design a LAN for a company that has 150 employees, each given a desktop computer attached to the LAN. What should be the data rate of the LAN if the typical use of the LAN is shown below:

- **a.** Each employee needs to retrieve a file of average size of 10 megabytes in a second. An employee may do this on average 10 times during the eight-hour working time.
- **b.** Each employee needs to access the Internet at 250 Kbps. This can happen for 10 employees simultaneously.
- **c.** Each employee may receive 10 e-mails per hour with an average size of 100 kilobytes. Half of the employees may receive e-mails simultaneously.

P13-6. In a Gigabit Ethernet LAN, the average size of a frame is 1000 bytes. If a noise of 2 ms occurs on the LAN, how many frames are destroyed?

P13-7. In a Fast Ethernet LAN, the average size of a frame is 1000 bytes. If a noise of 2 ms occurs on the LAN, how many frames are destroyed?.

P13-8. In a Standard Ethernet LAN, the average size of a frame is 1000 bytes. If a noise of 2 ms occurs on the LAN, how many frames are destroyed?

P13-9. If an Ethernet destination address is 07:01:02:03:04:05, what is the type of the address (unicast, multicast, or broadcast)?

P13-10. An Ethernet MAC sublayer receives 42 bytes of data from the upper layer. How many bytes of padding must be added to the data?

P13-11. In a 10-Gigabit Ethernet LAN, the average size of a frame is 1000 bytes. If a noise of 2 ms occurs on the LAN, how many frames are destroyed?

13.8 SIMULATION EXPERIMENTS

13.8.1 Applets

We have created some Java applets to show some of the main concepts discussed in this chapter. It is strongly recommended that the students activate these applets on the book website and carefully examine the protocols in action.