Networks Homework 10 (Due Sun 11/15/20)

1. True or false.

   (a) Sometimes propagation delay can be longer than queueing delay and sometimes it can be shorter.

   (b) CAT6 Ethernet cable typically can carry a signal farther than fiber optics before the signal fades too much to be read.

   (c) Coax typically has a higher bandwidth than fiber optics.

   (d) IEEE 802.5 is not a protocol we covered very much in this class.

   (e) Two people interfering with each other's transmissions is a serious problem in modern switched internet.

   (f) In the original Ethernet and in Ethernet with hubs, it was possible to see other peoples' traffic besides your own.

   (g) A network administrator usually has to program in MAC addresses for each of a switch's ports so that traffic gets to the correct destinations.

   (h) A portion of every Ethernet frame is devoted to helping the sender and receiver stay in sync.

   (i) WEP is considered to be a pretty secure thing to use for Wi-Fi

2. My computer is using Wi-Fi channel 60. I must be using which band?

   (a) 2.4 GHz (b) 5 GHz (c) 60 GHz (d) not enough info to tell

3. Suppose we are trying to decide on a new communications system that will either send data using radio waves or infrared rays. Which of the following is true?

   (a) The radio wave system will have a better range, but worse bandwidth.

   (b) The radio wave system will have worse range, but better bandwidth.

   (c) The radio wave system will be better in both aspects.

   (d) The radio wave system will be worse in both aspects.

4. If node X in a wireless network wants to send something to node Y, it might happen that even if the airwaves appear totally clear, there might be another node sending something to Y and that could interfere with X's transmission. This problem has a name. What is it called?

5. In older Ethernet, there was a problem if the line was too long and a problem if a frame is too short. Both are related to a specific part of CSMA/CD. What is that part?

6. Of the four types of delay we covered, which one most has to do with the fact that your packet is not the only one on the network?

7. This is a picture of what transmission medium specifically?

8. I showed a program called WifiInfoView in class that shows information about all the Wi-Fi access points it can see. It shows things like SSID, MAC address, security type, and more. What type of Wi-Fi frames does the program get this information from?

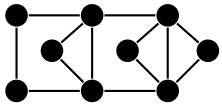
9. Assuming data is traveling at the speed of light, how long will it take the data to travel the 25 miles between the Mount's Emmitsburg and Frederick campuses?

10. Compute the transmission delay for a 1526-byte packet on a 4 Gbps connection.

11. (a) In the first step of the exponential backoff procedure used in CSMA/CD, a random backoff between 0 and 3 is used. A random backoff between 0 and what value is used at the fifth step of the procedure?

    (b) What causes someone to have to do the exponential backoff process in the first place?

12. Find a spanning tree in the graph below.



13. Suppose the data 000101001 is sent but gets corrupted into 100101001.

    (a) Compute the parity bits for both of these.

    (b) Is the parity bit able to detect the error in this case or does it miss it?

14. Suppose a system uses frames of 1000 bytes. A certain error-correcting code would require an additional 40 bytes of data be sent with each frame. Suppose only one out of every 500 frames on average has an error. From the point of view of minimizing data usage, would it be better to use an error detecting code with a 4-byte checksum instead? Explain.