Name: _____

CS422 Homework #3

Due in class on Monday, March 3rd

Consider an 802.11n Wi-Fi network operating at a very high speed of 30 megabits per second, and consider the Wi-Fi frame illustrated in Figure 16.9 of the text. The complete header and CRC occupy 34 octets, and the payload can range from 0 to 2312 octets. When a frame is transmitted, the hardware first sends a preamble and some physical layer convergence. For purposes of this homework, however, we will ignore the preamble and physical layer bits, and concentrate only the transmission of the frame itself.

1. How long will it take to transmit a frame and what is the effective rate at which data is transferred if a frame carries 1 octet of data, 1500 octets of data, and 2312 octets of data?

2. Consider the RTS/CTS exchange in figure 16.10 of the text. If an RTS/CTS exchange occurs when sending each frame, and the SIFS and DIFS delays occur as indicated, how are the times and effective data rates in the three previous question affected?

3. How long will it take to download a 1.6 GByte movie (1717986919 8-bit bytes) with and without the RTS/CTS protocol using each of the three values of data per frame?