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Operating Systems

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HW5 Task 1

2. Yes, I think it would be possible to transmit the documents over the network at full speed because the scanner has a data rate of 1 MB/sec and the 802.11 wireless network has a data rate of 37.5 MB/sec. This means that the wireless network can transmit all of the data from the scanner at the scanner's highest speed.

6.

- a. In the DMA transfer for word-at-a-time, you need to acquire the bus and request memory transfer, actually transfer the data, and then acknowledge each time. In this mode all three of these would take $(t_1 + t_2)$ time, so after 1000 words, word-at-a-time mode would take $3000 \times (t_1 + t_2) \text{ nsec}$ in total.
- b. In the DMA transfer for burst you need to perform the same steps, but all 1000 words can be transferred at once (like a burst) each in time t_2 during the middle of the process in the second step. So Burst mode would take $3t_1 + 1002t_2 \text{ nsec}$ in total because you need t_1 and t_2 for each of the three steps, but the only step you need to do 1000 times for each word is t_2 during the transfer phase of the DMA process.
16. The output files for a printer are normally spooled on disk before being printed because it allows for multiple users to use and interact with the character special file without someone keeping it open unnecessarily long. If a user were to open the special file and do

nothing for a long time, no other processes could print anything. Spooling helps to address this problem by putting the entire files in the spooling directory.