

## ECE 429 / 629 Homework #1

This homework covers Sections 1.1-1.2, 1.4-1.7, 1.11 of the textbook.

1. Answer question 1.1 in the textbook. Use the assumptions found on p. 23.
2. Answer question 1.2 in the textbook. For (a), use Fig. 1.22. For (e), you should assume that sales of the old chips will be unaffected by the new facility.
3. Answer question 1.4 in the textbook. For (b), just consider one of the two drives.
4. Answer question 1.9 in the textbook. Ignore Fig. 1.25.
5. Suppose a particular hard drive is rated with a 1,200,000-hour MTTF. What percentage of such drives is expected to fail within the first five years of operation? Assume that the drives are used continuously, 24 hours a day.
6. You have a computer system composed of the following components, whose individual MTTFs are given:
  - 1 CPU, 200,000-hour MTTF
  - 1 power supply, 100,000-hour MTTF
  - 1 fan, 300,000-hour MTTF
  - 1 hard drive, 1,000,000-hour MTTF
  - 1 memory system, 2,000,000-hour MTTF

What is the MTTF of the entire system? Assume that the lifetimes are exponentially distributed, that failures are independent, and that the failure of any one component causes the system to fail.