Exam II
Administered: Wednesday, October 9, 2002
26 points

For each problem part: 0 points if not attempted or no work shown,
1 point for partial credit, if work is shown,
2 points for correct numerical value of solution

Problem 1. (10 points)

We are using a CDR burner to burn 700-MB cds. Sometimes, the final CDRs contain defective sectors. We burn 20 CDRs. From our sample, we find a sample mean of defective bytes of 5.8 MB with a sample standard deviation of 1.2 MB.

Based on this information, answer the following questions.

(a) What PDF is appropriate for determining a confidence interval on the mean in this problem?
(b) Find the lower limit on a 95% confidence interval on the mean.
(c) Find the upper limit on a 95% confidence interval on the mean.
(d) Are we 95% confident that this CDR burner creates cds with less than 1 MB of defective data?
(e) What fraction of CDR burners create cds with less than 2 MB of defective data?

Problem 2. (8 points)

A particular device is powered by four batteries. Each battery has a mean life time of 9 months. The device only operates if all four batteries continue to function.

(a) What PDF would describe the probability that an individual battery is operating after ten months?
(b) What is the probability that an individual battery is operating after ten months?
(c) What PDF would describe the probability that all 4 batteries are functioning after ten months?
(d) What is the probability that the device still functions after ten months?

Problem 3. (8 points)

We run a warranty company that provides replacement parts for digital cameras. If our research team tells us that on average digital cameras have a lifetime of 6 years with a standard deviation of 1.5 years, then answer the following questions.

(a) If we provide a warranty for all cameras lasting less than 4 years, what fraction of the cameras can we expect to replace?

(b) If we only want to replace 2% of the cameras, how long should our warranty last?

(c) What PDF did you use to solve (a) & (b)?

(d) If we want our warranty program simply to break even, and the average cost of a digital camera is $300. How much should we charge for the 4-year (part a) warranty protection?