MATH 333:Probability & Statistics. Exam 2 (Fall 2002)

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Name: SSN: Section #

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➔ **Must show all work to receive full credit.**

I pledge my honor that I have abided by the Honor System. _____
                                                                      (Signature)

Scores	
#1	
# 2	
#3	
#4	
#5	
#6	
Total	

Question 1. (4 pts each)

A student takes a multiple-choice test and guesses on each of the 10 questions. There are 4 choices on each question and each question is worth 1 point.
    a) Does this conform to the requirements of a Binomial experiment? Explain precisely with reference to the above problem.

Determine the following (show your work):
    b) What is the mean or the expected score of that student?
    c) What is the probability that the student will score 0 in this test?
    d) What is the probability that the student will score at least 2?
    e) What is the probability that the student will get an A in the test?
(Note: a student has to get 9 or more to get an A.)

Question 2.

Let X have an exponential distribution with parameter λ.

    (a) Find a general expression for the (100p)th percentile of the distribution. (10 pts)
    (b) Find the median for $\lambda = 3$. (6 pts)

Question 3.   (8 pts each)

Assume that the drying time, for a certain type of paint, is normally distributed with a mean of 2 hours and a standard deviation of 15 minutes.

   a) What is the probability that a paint job will take more than 2.5 hours to dry?
   b) If two independent paint jobs are done, what is the probability that both jobs will take more than 2.5 hours to dry?

Question 4.   (8 pts each)

During rush hour path trains arrive on the average every 8 minutes, and the inter-arrival times are exponentially distributed. You arrive on the platform at a random time.

   a) What is the probability that you will have to wait more than 3 minutes for the next train?
   b) What is your expected waiting time, and its standard deviation?

Question 5. (8 pts each)

The diameter of manufactured PVC pipe is normally distributed, with a mean diameter of 1.01 inch and a standard deviation of 0.003 inch.

a) What is the probability that a random sample of $n = 9$ sections of pipe will have a sample mean diameter between 1.009 inch and 1.013 inch?
b) How is the standard deviation of the sample mean changed when the sample size is increased from $n = 9$ to $n = 25$?

Question 6. (8 pts each)

When a computer disk manufacturer tests a disk, it writes to the disk and then tests it using a certifier. The certifier counts the number of missing pulses (i.e. errors). The number of errors on a disk has a Poisson distribution with $\lambda = 0.3$.

a) What is the expected number of errors per disk, and what is the standard deviation?
b) What percentage of disks have two or fewer errors?

END