IAM 530 2014-2015 Fall

Homework 3

1) A basketball player shoots 10 shots and probability of hitting is 0.5 on one shot.
   a) What is the probability of hitting eight shots?
   b) What is the expected value and variance of the number of shots hit?

2) A jar contains 30 green jelly beans and 20 purple jelly beans. Suppose 10 jelly beans are selected randomly. Find the probability of obtaining exactly five purple beans.

3) A shipment of 50 mechanical devices consist of 42 good ones and 8 defective. An inspector selects five devices randomly. What is the probability that at most three are good?

4) The average number of calls arrive at a switchboard during one hour is 10. What is the probability of exactly seven calls arrive?

5) In a shopping mall the waiting time for an elevator is found to be uniformly distributed between 1 and 5 minutes.
   a) Write down the probability density function.
   b) What is the probability of waiting no more than 3 minutes?
   c) What is the probability of a waiting time between 2 and 3 minutes?
   d) What is the expected waiting time?

6) Jobs are sent to a printer at an average of 3 jobs per hour.
   a) What is the expected time between jobs?
   b) What is the probability that the next job is sent within 5 minutes?

7) Suppose X~Normal(3,0.16)
   a) Find P(X>3.3)
   b) Find the 98th percentile of X

8) Assume X is a continuous random variable with pdf $f(x) = e^{-(x+2)}$ $\quad if \quad -2 < x < \infty$
   a) Find the moment generating function of X
   b) Find the expected value and variance of X using the moment generating function.