UC Berkeley
Department of Electrical Engineering and Computer Sciences

EECS126: Probability in EECS

Problem Set 7
Fall 2013

Issued: Tuesday, October 15, 2013 **Due:** In class Thursday, October 24, 2013

Problem 1. Problem 4 of HW6.

Problem 2. Problem 4 of Chapter 3, page 57.

Problem 3. Problem 5 of Chapter 3, page 57.

Problem 4. Problem 1 of Chapter 4 parts (a) and (b).

Problem 5. Let $(V_n,\ n \geq 0)$ be i.i.d. $N(0, \sigma^2)$ and independent of $X_0 = N(0, u^2)$. Define

$$X_{n+1} = aX_n + V_n,\ n \geq 0.$$

(a) What is the distribution of X_n for $n \geq 1$?

(b) Find $E(X_{n+m}|X_n)$ for $0 \leq n < n + m$.

(c) Find u so that the distribution of X_n is the same for all $n \geq 0$.

Problem 6. Let θ be uniform random variable in $[0, 1]$, and given θ, random variable X is uniformly distributed in $[0, \theta]$. Find $E[\theta|X]$.