Denker **Spring 2009**

519 Stochastic Processes- Assignment

Due Date: Tuesday, 22–09–2009

Problem 1: Let μ be a probability measure on the unit cube $[0,1]^2$. Show that there exist probability measures μ_x, $x \in [0,1]^2$, such that for every integrable $f \in L_1(\mu)$

$$\int f d\mu = \int \left[\int f d\mu_x \right] \mu(dx).$$

Use the existence of conditional distributions as given at the bottom of page 11 of the book. Define $\mathcal{G}$ to be the pull back under the projection $(x,y) \mapsto y$ of the Borel-σ algebra on $[0,1]$ and define Y to be the identity.

Problem 2: State the definiton of independence and give a detailed proof of Theorem 1.1.16 on page 18 of the book.

Problem 3: Exercise 1.2.4 on page 24 of the book.

Problem 4:

Exercise 1.2.5 on page 24 of the book.

Problem 5:

Exercise 1.2.7 on page 25 of the book.

Problem 6:

Exercise 1.2.12 on page 28 of the book.

Problem 7:

Exercise 1.2.15 and 1.2.16 on page 31 of the book.