

The University of Winnipeg
Department of Mathematics & Statistics
STAT-4401(3): Assignment 3
Due Date: Wednesday, Feb.18, 2015; 1:00 p.m.; my office.
Instructor: M. Ghahramani
Show all your work.

1. Page 93, problem 38 of textbook.
2. Page 93, problem 45 of textbook.
3. Page 94, problem 46 of textbook.
4. Page 95, problem 47 of textbook.
5. Suppose that X and Y are discrete random variables satisfying:

$$\begin{aligned} X &\sim \text{Poisson}(\lambda) \\ Y|X &\sim \text{Binomial}(X, p). \end{aligned}$$

Find the probability generating function of Y , $g_Y(s) = E(s^Y)$, and use it to name the distribution of Y , fully specifying all parameters. **Note:** This question says the conditional distribution of Y given X follows a binomial distribution where the number of trials, X , is itself a random variable.