ĐẠI HỌC QUỐC GIA HÀ NỘI
TRƯỜNG ĐẠI HỌC CÔNG NGHỆ

Subject: **Statistics**
Class: **MAT1101 4**
Semester **I, 2014-2015**
Lecturer: **Đặng Thanh Hải**

Total time allowed: 60 minutes
The test content is on 1 page

Student Info. (filled by student only)	**Marks (for lecturer only)**
Full name:	Task1.Q1: .....
Date of birth:	Task1.Q2: .....
Student ID:	Task1.Q3: .....
	Task1.Q4: .....
	Task1.Q5: .....
	Task2.Q1: .....
	Task2.Q2: .....
	Task2.Q3: .....
	Tổng: .....

Task 1. Everyday Sơn can catch the Tram 15 to his office with probability p or go by bike otherwise. This decision is independent of those on any other days before. It is only when going by Tram 15
Sơn has a chance to meet Thuỷ, his colleague, with a probability q independent of everything else since Thuỷ also hops on Tram 15 to the office later. Let X be the number of days that Sơn goes by tram to work and Y the number of times that he meets Thuỷ during a fixed number of n days.

- Q1 (2 pts): Suppose that Sơn did not meet Thuỷ on a given working day, what is the probability that he had taken the tram to work?
- Q2 (1 pts): Find the conditional pmf of Y given X.
- Q3 (1 pts): Find the joint pmf of X and Y.
- Q4 (1 pts): Find the marginal pmf of Y
- Q5 (1 pts): Find the conditional pmf of X given Y.

Task 2. A sequence of characters is transmitted over a channel that introduces errors with probability $p = 0.01$.

- Q1 (1 pts). What is the pmf of N, the number of error-free characters between erroneous characters?
- Q2 (1 pts). What is $E[N]$?
- Q3 (2 pts). Suppose we want to be 99% sure that at least 1000 characters are received correctly before a bad one occurs. What is the appropriate value of p?

G'luck n' Have funs!