T122 Quiz 3 on Hwk STAT301: A First Course in Probability FORM A

Name_____ ID#:_____ Serial #:___

Instructions. The quiz is 20 minutes. Write **important steps** to arrive at the solution of the following **3** problems.

1. (7 marks) A paperboy purchases newspapers at 10 cents and sells them at 15 cents. However, he is not allowed to return unsold papers. If his daily demand is a binomial random variable with $n = 3$, $p = 5/8$, approximately how many papers should he purchase so as to **maximize** his expected profit?

2. (6 marks) Suppose that $P\{X = 0\} = 1 - P\{X = 1\}$. If $E[X] = 4Var(X)$, find $P\{X = 0\}$

3. (7 marks) Let X be a Poisson random variable with parameter λ . Show that $P\{X = i\}$ increases monotonically and then decreases monotonically as i increases, reaching its maximum when i is the largest integer not exceeding λ . HINT: Consider $P\{X = i\}/P\{X = i - 1\}$