

ISyE 2027 D Final
Fall 2014

Name

Please be neat and show all your work so that I can give you partial credit.
HAPPY HOLIDAYS.

Question 1
Question 2
Question 3
Question 4
Question 5
Total

(15) **1.** Two hunters shoot at a deer which is hit by exactly one bullet. If the first hunter hits his targets with probability 0.3 and the second with probability 0.6, what is the probability that the second hunter hit the deer?

(25) **2.** (a) (10) Three independent events have probabilities $1/4$, $1/3$, and $1/2$, respectively. What is the probability exactly one will occur?

(b) (15) Suppose we roll two dice. What is the probability that the sum is 7 given that neither die showed a 6?

(25) **3.** (a) (10) Suppose X has density function $f(x) = 4x^3$ for $0 < x < 1$ and 0 otherwise. Find the cumulative distribution function of X .

(b) (10) Compute the median of X .

(20) 4. (15) (a) Suppose you roll two dice and let X and Y be the two numbers that appear. Compute the probability mass function of $|X - Y|$

(b) (5) Compute $E[|X - Y|]$.

(20) **5.** Suppose X takes on the values -2, -1, 0, 1, 2 with probability $1/5$ each, and let $Y = X^2$.

(a) (10) Find $Cov(X, Y)$.

(b) (10) Are X and Y independent? Justify your answer.