

Instructions: This is an open-book quiz. There are 2 problems, each worth 5 points. Put your name in the blanks above. **Show your work!** if there is not enough room, use the back page. Give all numerical answers as **fractions**, or as decimals, correct to at least **3 significant digits**. Remember: Probabilities are **never** greater than 1!!

- (1) Let A and B be events such that $P(\tilde{A}) = 4/5$, $P(B) = 1/3$, $P(A | B) = 1/6$.
- (a) Find $P(A)$.

 - (b) Find $P(A \cap B)$.

 - (c) Find $P(A \cup B)$.

 - (d) Find $P(B | A)$.

 - (e) Are A and B independent? Why, or why not?
- (2) A laboratory blood test is 90% effective in detecting a certain disease when it is, in fact, present. However, the test also yields a “false positive” result for 2% of the healthy persons tested. If 0.1% of the population actually has the disease, what is the probability that a person has the disease, given that the test result is positive?