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STAT/MATH 416 001 Fall 2009

Practice Quiz #2

October 9, 2009

You are not allowed to use books or notes. Non-programmable calculators approved for 1/P exam are permitted. Please read the directions carefully. The quiz is graded out of 50 points. You have 20 minutes to complete it. Please show all your work.

1. (20 points) An assembly plant receives the same number of part shipments from two suppliers. Each part from the supplier A has 2% chance of being defective, but chances of a defect are only 1% if the part comes from supplier B. A randomly selected shipment is opened and checked, and out of 50 parts, 1 is defective. What is the probability that this shipment is from A?

2. (20 points) A biased coin A needs to be flipped on average 2.5 times to show heads, and a biased coin B needs on average 3 flips to show heads. Both of these coins are flipped at the same time. What is the probability of at least one of them showing heads? (Hint: first find the probabilities of landing heads for each of the coins.)

3. (10 points) In an event of an accident, an insurance company pays \$40 per day for up to 5 days of a replacement car rental. Let X be the number of days for the car rental. X be a discrete random variable with the following probability mass function:

$$P(X = n) = \begin{cases} 0.5 & : n = 1, \\ 0.25 & : n = 2 \\ 0.1 & : n = 3, \\ 0.05 & : n = 4, \\ 0.1 & : n = 5, \\ 0 & : \text{otherwise.} \end{cases}$$

- (a) (5 points) Compute the expected payment for a car rental under this policy.

- (b) (5 points) Compute the variance of a payment for a car rental under this policy.