King Fahd University Of Petroleum & Minerals
Department of Mathematics & Statistics
STAT416 : Stochastic Processes for Actuaries (142)
Assignment # 3 (Due April 19, 2015)

Problem.1 Defects occur a long the length of a filament at rate of $\lambda = 2$ per foot.

a. Calculate the probability that there are no defects in the first foot of the filament(Answer: e^{-2})

b. Calculate the conditional probability that there are no defects in the second foot of the filament, given that the first foot contains a single defect?(Answer: e^{-2})

Problem.2 Messages arrive at a telegraph office as a Poisson process with mean rate of 3 messages per hour.

a. What is the probability that no messages arrive during the morning hours 8:00am to noon 12:00pm (Answer: e^{-12})

b. What is distribution of the time at which the first afternoon message arrives (Answer: Exponential with $\lambda = 3$)

Problem.3 Customers enter a store according to Poisson process of rate $\lambda = 10$ per hour. Independently, each customer buys something with probability $p = 0.30$ and leaves without making a purchase with probability $1 - p = 0.70$. What is the probability that during the first hour nine people enter the store and that 3 of these people make a purchase and 6 do not? (Answer: 0.0334)

Problem.4 Solve problem 6 page 412 of your text book. (Answer: See Solutions Manual)

Problem.5 Solve problem 12 page 413 part (a) of your text book. (Answer: See Solutions Manual)

Problem.6 Solve problem 14 page 414 part (a) of your text book. (Answer: See Solutions Manual)