Homework #16

Due by 7AM, Monday, April 13

Instructions: Do your work on your own paper and give only the numerical answers in eCampus. Give your answers rounded to **two digits to the right of the decimal**.

Let $\{X_n,T_n\}$ be a Markov renewal process with state space {a, b} and semi-Markov kernel Q given as

$$Q(t) = \begin{matrix} 0.6(1 - e^{-5t}) & 0.4 - 0.4e^{-2t} \\ 0.5 - 0.2e^{-3t} - 0.3e^{-5t} & 0.5 - 0.5e^{-2t} - te^{-2t} \end{matrix}$$

where t represents *days*.

a. What is the average time, *in hours*, between visits to state a?

b. What is the average time, *in hours*, between visits to state b?

c. Find the $\lim_{n\to\infty} P_i\{X_n = a\}$.

d. Find the $\lim_{n\to\infty} P_i\{X_n = b\}$.

e. Find the $\lim_{t\to\infty} P_i\{Y(t) = a\}$.

f. Find the $\lim_{t\to\infty} P_i\{Y(t) = b\}$.