Show all work for full credit, and use correct notation. Simplify answers completely.

A 4-state model has states: Healthy (0), Sick (1), Dead (2), and Terminally Ill (3).

The transition intensities are:

$$\mu_x^{01} = 0.0001e^{.06x}$$

$$\mu_r^{02} = \mu_r^{12} = 6\mu_r^{01}$$

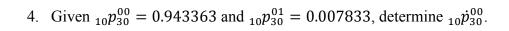
$$\mu_x^{01} = 0.0001 e^{.06x} \qquad \mu_x^{02} = \mu_x^{12} = 6 \mu_x^{01} \qquad \mu_x^{03} = \mu_x^{13} = 0.05 \mu_x^{01} \qquad \mu_x^{10} = 0.1 \mu_x^{01}$$

$$u_{\nu}^{10} = 0.1 u_{\nu}^{01}$$

$$\mu_x^{32} = 1.2 \mu_x^{02}$$

- 1. Determine $_{10}p_{30}^{31}$.
- 2. Determine an expression for $\mu_{30+t}^{0\tau}$.

3. Determine $_{10}p_{30}^{\overline{00}}$.



5. Use Euler's Forward Equation with a step size of 0.125 to approximate the value of $_{10.125}p_{30}^{00}$.