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:

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

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

1. Determine $1000 \cdot \mu_{40}^{1\tau}$

2. Determine $1000 \cdot C$, where C is such that $\mu_{40+t}^{32} = C \cdot e^{0.06t}$

3. Determine $_5p_{40}^{30}$.

4. Determine $_5p_{40}^{33}$

5. Determine $_5p_{40}^{32}$