Each problem is worth 10 points. Show all work for full credit, and use correct notation. Simplify answers completely. See other side for additional problems.

For Numbers 1 and 2, you are given a two decrement model with
\[ p_x^{(1)} = 0.8, \]
\[ p_x^{(2)} = 0.6, \] and decrement 1 is uniformly distributed in its associated single decrement model.

1. Determine \( q_x^{(1)} \) assuming decrement 2 is a discrete middle of the year decrement

2. Determine \( q_x^{(1)} \) assuming decrement 2 is a discrete decrement with 40% of the decrement occurring at time \( t = 0.4 \) and the rest occurring at time \( t = 0.6 \)
For Numbers 3 through 5, you are given a four state model with

\[ \mu_{x}^{01} = 0.010 \quad \mu_{x}^{02} = \mu_{x}^{12} = 0.060 \quad \mu_{x}^{03} = \mu_{x}^{13} = 0.001 \quad \mu_{x}^{10} = 0.006 \quad \mu_{x}^{32} = 0.080 \]

All other forces of transition are equal to zero. (This is implied if not otherwise stated.)

3. Determine \( 10p_{x}^{33} \)

4. Determine \( 10p_{x}^{00} \)

5. Determine \( 10p_{x}^{32} \)