Each problem is worth 10 points. Show all work for full credit, and use correct notation.

1. Smokers have a constant force of mortality of 0.10 and non-smokers have a constant force of mortality of 0.05. For a population of 30-year olds, 10% are smokers. Determine $q_{50}$ for this population of 30-year olds.

2. Each individual has a constant force of mortality, $\mu$, where $\mu$ is drawn from the uniform distribution on the interval [0.02,0.07]. Determine the value of $5q_x$.
3. At all ages, males have a force of mortality that is 10% higher than females. If \(20q_x = 0.2\) for females, determine \(20q_x\) for males.

For Numbers 4 and 5, use the L-TAM SULT to determine

4. \(10q_{20}\)

5. \(5|10q_{20}\)