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 0.1, and non-smokers have a constant force of mortality of 0.05. For a population of 30-year olds, 10% are smokers and 90% are non-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 [0.1,0.2]. Determine the value of $10p_x$. 
For Numbers 3 and 4, use the Illustrative Life Table to determine

3. $10q_{25}$.

4. $10.5q_{25}$.

5. Suppose the force of mortality is constant over the 2-year period centered at age 50. Determine the value of the force of mortality that is consistent with the mortality from the Illustrative Life Table.