

Show all work for full credit, and use correct notation. Simplify answers completely.  
See other side for additional problems.

1. You are given:

(i) Decrement 1 is a beginning of year decrement and  $q_x^{(1)} = 0.1$

(ii) Decrement 2 is an end of year decrement and  $q_x^{(2)} = 0.2$

(iii) Decrement 3 is SUDD and  $q_x^{(3)} = 0.3$

Determine  $q_x^{(3)}$

2. Given  $q_x^{(1)} = 0.1$  and  $q_x^{(2)} = 0.2$ , determine  ${}_{0.25}p_x^{(1)}$  using the MUDD assumption.

For Numbers 3 – 5, you are given:  $q_x^{(1)} = 0.25$  and  $q_x^{(2)} = 0.20$

3. If there is a uniform distribution of departures in the associated single decrement models for decrements 1 and 2, then determine  $q_x^{(1)}$

4. If there is a uniform distribution of departures in the double decrement model, then determine  $q_x^{(2)}$

5. Under the SUDD assumption for both decrements, determine  ${}_{0.4}q_x^{(1)}$