

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.

1. (10 points) For a double decrement model,  $q_x^{(1)} = 0.4$ ,  $q_x^{(2)} = 0.2$ , and  $q_x = 0.32$ . Determine  $q_x^{(2)}$ .

2. You are given the double decrement table:

$x$	$l_x^{(\tau)}$	$d_x^{(1)}$	$q_x^{(1)}$	$d_x^{(2)}$	$q_x^{(2)}$
95	-	-	0.20	400	-
96	-	400	-	200	0.25
97	-	-	-	-	-

Determine

- (a) (5 points)  $q_{96}^{(1)}$

- (b) (5 points)  ${}_2q_{95}^{(\tau)}$

3. (5 points each) Use the L-TAM Standard Service Table to determine

(a)  $q_{50}^{(w)}$

(b)  ${}_2q_{45}^{(i)}$

(c)  ${}_2p_{59}^{(\tau)}$

(d)  ${}_{12|2}q_{50}^{(r)}$

4. (10 points) For a triple decrement model,  $\mu_x^{(j)}(t) = 0.15 \cdot (4 - j)$ ,  $j = 1, 2, 3$ .  
Determine  ${}_{0.1|0.4}q_x^{(2)}$ .