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

1. You are given:
   
   (i) \( d = 0.10 \)
   
   (ii) \( q_{75} = 0.02 \)
   
   (iii) \( A_{76} = 0.52 \)

   Determine \( A_{75} \).

2. A company issues \( n \) independent identical continuous whole life insurances to 35-year olds with benefit of 10,000. Using \( CF(\mu = 0.03, \delta = 0.03) \) actuarial assumptions and the normal approximation, the probability that the total present value of all benefits paid exceeds 2,500,000 is 0.5. Determine \( n \).
   (You don’t need the standard normal distribution table to complete this question.)

3. Determine the actuarial accumulated value at age 40 of a discrete 10-year term insurance of 10,000 issued to (20), using SULT actuarial assumptions.
4. A whole life annuity issued to (40) pays 500 at the end of each year. Using $i = 0.06$ and $DML(\omega = 90)$ actuarial assumptions, determine the probability that the sum of the payments made is greater than or equal to 10,000.

5. A 10-year deferred whole life insurance issued to (x) pays 100,000 at the end of the quarter of death. Using a constant force of mortality, $\mu = 0.03$, and $i = 0.05$, determine the probability that the present value of the benefit is less than 32,000.