Show all work for full credit, use correct notation, and clearly mark your answer.

For numbers 1 and 2, you are given:

a. \( i = 0.05 \)
b. \( \bar{a}_{50} = 15 \)
c. \( \bar{E}_{40} = 0.6 \)

1. Determine the actuarial present value of a 10-year deferred whole life annuity due on \((40)\) with benefit equal to 5000 per month. Use the UDD assumption and note that for \( i = 0.05 \), \( \alpha(12) = 1.000197 \) and \( \beta(12) = 0.46651 \).

2. Determine the actuarial present value of a 10-year deferred whole life annuity due on \((40)\) with benefit equal to 5000 per month using the two-term Woolhouse Formula.
3. Given $\bar{a}_x = 13$, $\bar{a}_{x:n} = 7$, and $\mu E_x = 0.6$, determine $\bar{a}_{x+n}$.

4. Use constant force assumptions with $\delta = 0.03$ and $\mu = 0.02$ to determine the expected present value of a continuous 10-year temporary annuity issued to $(x)$ paying at a rate of 1000 per year.

5. Use constant force assumptions with $\delta = 0.03$ and $\mu = 0.02$ to determine the expected present value of a continuous 10-year certain and life annuity issued to $(x)$ paying at a rate of 1000 per year.