Math 312 - Mathematical Theory of Interest - Practice Quiz # 3

1. (1 point each) Please circle either T (true) or F (false) for each of the below statements.

    A)   T   F $30000/a_{\overline{60}|0.06}$ represents the monthly loan payment amount on a \$30,000 car with a 5-year loan and level monthly payments at a nominal annual rate of 6%, compounded monthly.

    B)   T   F   In an amortized loan, 100% of the interest owed on the outstanding balance must be repaid each period.

    C)   T   F   The retrospective method for finding the outstanding loan balance at time t computes the difference between the future value of the original amount borrowed and the future value of all payments made on the loan.

    D)   T   F   The interest rate of an amortized loan must be constant over the life of the loan.

2. (8 total points) You borrow $300{,}000\,\text{€}$ with a 30-year mortgage at a nominal interest rate of $i^{(12)} = 6\%$.

    A) (4 points) What is the monthly level payment K for this loan?

    B) (4 points) You decide to refinance your loan at the end of the 10th year for 15 years at a nominal annual interest rate of 4.5% convertible monthly. What is the new monthly payment?

3. (4 points) A company has a loan of 100,000 to be repaid with 30 annual end-of-year level payments. The principal and the interest in the 21st payment are the same. Find the principal repaid in the 10th payment.

$$\text{A) } 1862 \qquad \text{B) } 1871 \qquad \text{C) } 1884 \qquad \text{D) } 1901 \qquad \text{E) } 1913$$

4. (4 points) Consider a 30-year home mortgage at a 6.6% nominal annual interest rate compounded monthly, with level end-of-month payments of 766.39. What is the first period in which the principle repaid is over 500?

I) 269

II) 274

III) 278

IV) 281

V) 284