

MAP 4170 – 01
Test 5

Name: _____
Date: November 5 , 2007

Each problem below is worth 10 points. Show work for full credit.

1. Jones can repay a 20-year loan of 100,000 with annual payments in one of two ways:
 - (i) the amortization method using rate $i = .12$;
 - (ii) the sinking fund method where the lender charges rate $i = .10$ and the sinking fund deposits earns rate j .

All rates are annual effective interest rates. Find the value of j that makes the methods equivalent; i.e., find the value of j that makes the annual payments equal.

A. 3.7% B. 3.9% C. 4.1% D. 4.3% E. 4.5%

2. Brown deposits 5000 in a 5-year investment that pays interest quarterly at 8%, compounded quarterly. Upon receipt of each interest payment, Brown reinvests the interest in an account that earns 6%, compounded quarterly.

Determine Brown's yield rate over the 5 year period, as a nominal interest rate compounded quarterly.

A. 1.9% B. 2.1% C. 7.7% D. 7.8% E. 8.5%

3. A 30-month loan is to be repaid with equal installments at the end of each month. The amount of interest paid in the twenty-first installment is \$280. The amount of interest paid in the twenty-sixth installment is \$160. Calculate the amount of interest in the sixteenth installment.

- A. 370 B. 380 C. 390 D. 400 E. 410

4. A loan of 1000 is being repaid in ten years by annual installments of 100, plus interest on the unpaid balance at 10% per annum. The installments and interest payments are reinvested at 8% per annum. Calculate the annual effective yield rate of the loan.

- A. 6.03% B. 6.74% C. 7.45% D. 8.15% E. 8.86%

5. Smith borrows 30,000 at an annual effective interest rate of 10%. He agrees to make annual payments at the end of each year for 9 years, and an additional balloon payment, X , at the end of the tenth year. Each of the first 9 payments equals 25% more than what is owed in interest at the time of the payment. The balloon payment, X , equals the amount needed to pay off the loan. Determine X .
- A. 23,290 B. 23,887 C. 25,679 D. 26,276 E. 26,888