1. You deposit a lump sum amount of $5,000 today. Assuming the following interest rates structure: k=6% for the first 10 years, 8% for the second 10 years and 10% for the last 10 years. What is the future value of the deposit after 30 years if the account offers (a) simple interest rates? (b) annually compounded interest rates? (c) monthly compounded interest rates? (d) continuously compounded interest rates?

2. You expect to receive $1,000,000 ten years from today. Suppose the interest rates will be 8% for the first 5 years and 10% for the next 5 years, what is the present value if we have (a) simple interest rates? (b) annually compounded interest rates? (c) monthly compounded interest rates? (d) continuously compounded interest rates?

3. You have the choice between two accounts: account A has APR=8% with continuous interest compounding and account B has APR=8.1% compounded semiannually. Which one offers a better deal and why?

4. What is the actual yield (effective rate of interest or APY) of the following nominal rates of interest (APR): (a) 15%, interest compounded quarterly? (b) 18%, interest compounded monthly? (c) 12%, interest compounded semi-annually? (d) 10%, interest compounded continuously?

5. What is the equivalent nominal rate with quarterly interest compounding if (a) APR=8%, interest compounded annually? (b) APR=10%, interest compounded monthly? (c) APR=12%, interest compounded semiannually? (d) APR=10%, interest compounded continuously?

6. What is the equivalent nominal rate with interest compounded continuously if (a) APR=8%, interest compounded annually? (b) APR=10%, interest compounded monthly? (c) APR=12% compounded semiannually? (d) APR=10% compounded quarterly?

7. Suppose you deposit $1,000 at the end of each year for 20 years. Find the future value of the cash flow at the end of the 30th year if interest rate is (a) 10% simple interest rate? (b) APR=10%, interest compounded annually? (c) APR=10%, interest compounded continuously?

8. Suppose you deposit $1,000 at the end of each year for 10 years. Find the present value of the annuity if the interest rate is (a) 10% simple interest rate? (b) APR=10%, interest compounded annually? (c) APR=10%, interest compounded continuously?