

1. Your firm has just gotten a \$500,000 loan from its bank. The loan carries an annual interest rate of 8% and will be amortized in equal quarterly payments (at the end of each quarter) over the next 5 years. Show below the unpaid balance after 10 quarters (i.e., at the end of the 10th quarter and after the 10th quarterly payment) as well as the finance charge (i.e., interest paid) in the 10th quarter.

ANSWER: (a) Balance _____ ; (b) Interest _____

2. Your aunt has just received a lump sum of \$1,000,000 from her pension plan upon her retirement. She plans to invest it in an annuity account that will pay her an equal amount at the end of each year for the next 20 years, at which point the initial capital of \$1,000,000 (plus its interest) will be totally depleted. Show below (a) the annual annuity income and (b) the money left in the annuity at the end of the first year after the first payment has been made to your aunt.

ANSWER: (a) Annual income _____ ; (b) Money left _____

3. You plan to buy your dream summer home 15 years from now. Currently such homes cost \$200,000 but the price will rise due to inflation, which is projected to average 3.5% per year over the next 15 years. You plan to save an equal amount of money at the end of each year so that by the 15th year you have a balance equal to the price of the home at that time. If you estimate to make an average rate of return of 9% a year, how much money should you invest each year?

ANSWER: _____

4. You plan to retire upon your 65th birthday. You are now 30 years old. You plan to buy a pension annuity that will pay you \$80,000 from the time you become 66 to your 80th birthday. The pension plan requires you make equal quarterly payments (premiums) starting one quarter after your 30th birthday and until you have your 65th birthday. If the interest rate assumed in this plan is 7%, what is the quarterly premium?

ANSWER: _____

5. Financial institutions often create synthetic instruments out of existing instruments. In this case an investment bank plans to buy Treasury Bonds with 10 years to maturity at their current market price of \$1,000 per bond. Then you plan to create two instruments. One instrument (like a zero coupon bond) will promise only one maturity payment of \$1,000 in 10 years. The other instrument will pay only interest income at a coupon interest rate of 6% per year. If the current market interest rate on such T-Bonds is 5.5% per year, how much money will you earn per bond?

ANSWER: _____

6. You have just renegotiated the interest rate of your home mortgage loan. (This is called rate modification.) The old interest rate was 8%, and there were 80 months to repay the balance of \$200,000. The new mortgage will carry a lower rate of 6% and will still leave 80 months to pay the same balance. The lender requires a \$2,000 “rate modification” fee. How much money will you save or lose in present value dollars today if you go through with this rate modification deal? (Note: the payment period is monthly.)

ANSWER: _____

7. You have invested \$800,000 in securities. The portion invested in an index fund has just reported a return of 8%, whereas the portion invested in Treasury bonds has realized a return of 4%. If the combined (average) return on the whole portfolio is 6%, how much money have you invested in the index fund and the T-Bonds, respectively?

ANSWER: _____

8. Your firm’s sales grew by 6% the first quarter of 2004 and 8% the second quarter. You expect the sales growth to ease to 4% the third quarter and then rise to 10% the fourth quarter. What is the projected annual sales growth for the whole 2003 year? (Note: these are rates per quarter.)

ANSWER: _____

9. You plan to buy a bond with 15 years to maturity, a coupon rate of 10% (paid semi-annually) and a maturity value of \$1,000. The YTM for this bond is 8% right now. Based on your bond analyst’s projections, you expect the YTM to rise to 9% at the end of the first year and remain at that level for the remaining life of the bond. What is the capital gain or loss you expect to realize between time 0 (now) and one year from now?

ANSWER: Gain _____ Loss _____

10. In January 2003 your firm sold a Dutch firm goods payable in Euros worth EU50,000,000. At that time the exchange rate of the dollar in euros was EU0.95 per dollar. Because this was a sale on credit, your Dutch customer must now pay this bill. The exchange rate is EU0.80 per dollar now. How much money in dollars have you lost or gained from this sale on credit?

ANSWER: LOSS \$ _____ ; GAIN \$ _____

DEADLINE: Tuesday, May 10, 2005.

Each correctly answered question is worth ONE point. Ten points all together.

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