Seminar 1

The Time Value of Money

1.

For liquidity purposes, a client keeps $100,000 in a bank account. The bank quotes a stated annual interest rate of 7 percent. The bank's service representative explains that the stated rate is the rate one would earn if one were to cash out rather than invest the interest payments. How much will your client have in his account at the end of one year, assuming no additions or withdrawals, using the following types of compounding?

A. Quarterly
B. Monthly

2.

A bank quotes a rate of 5.89 percent with an effective annual rate of 6.05 percent. Does the bank use annual, quarterly, or monthly compounding?

3.

A bank pays a stated annual interest rate of 8 percent. What is the effective annual rate using the following types of compounding?

A. Quarterly
B. Monthly

4.

A couple plans to set aside $20,000 per year in a conservative portfolio projected to earn 7 percent a year. If they make their first savings contribution one year from now, how much will they have at the end of 20 years?

5.

Two years from now, a client will receive the first of three annual payments of $20,000 from a small business project. If she can earn 9 percent annually on her investments and plans to retire in six years, how much will the three business project payments be worth at the time of her retirement?

6.

To cover the first year's total college tuition payments for his two children, a father will make a $75,000 payment five years from now. How much will he need to invest today to meet his first tuition goal if the investment earns 6 percent annually?

7.

A client has agreed to invest €100,000 one year from now in a business planning to expand, and she has decided to set aside the funds today in a bank account that pays 7 percent compounded quarterly. How much does she need to set aside?

8.

A client can choose between receiving 10 annual $100,000 retirement payments, starting one year from today, or receiving a lump sum today. Knowing that he can invest at a rate of 5 percent annually, he has decided to take the lump sum. What lump sum today will be equivalent to the future annual payments?

9.

At retirement, a client has two payment options: a 20-year annuity at €50,000 per year starting after one year or a lump sum of €500,000 today. If the client's required rate of return on retirement fund investments is 6 percent per year, which plan has the higher present value and by how much?

10.

A client seeking liquidity sets aside €35,000 in a bank account today. The account pays 5 percent compounded monthly. Because the client is concerned about the fact that deposit insurance covers the account for only up to €100,000, calculate how many months it will take to reach that amount.

11.

A client plans to send a child to college for 4 years starting 18 years from now. Having set aside money for tuition, she decides to plan for room and board also. She estimates these costs at $20,000 per year, payable at the beginning of each year, by the time her child goes to college. If she starts next year and makes 17 payments into a savings account paying 5 percent annually, what annual payments must she make?

12.

A couple plans to pay their child's college tuition for 4 years starting 18 years from now. The current annual cost of college is C$7,000, and they expect this cost to rise at an annual rate of 5 percent. In their planning, they assume that they can earn 6 percent annually. How much must they put aside each year, starting next year, if they plan to make 17 equal payments?