

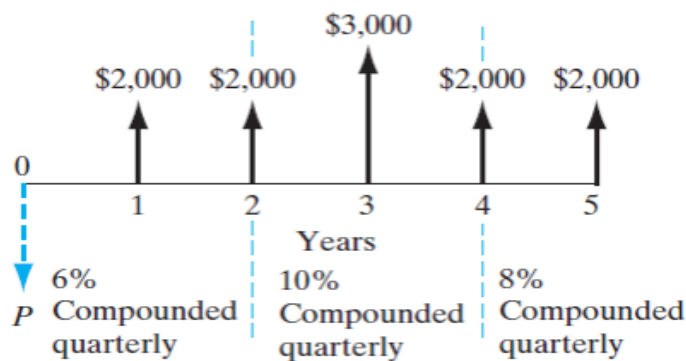
IE 342 2018-2019 Fall Semester

Study Set 2

Please note that we will not send the solution key! But you can ask your questions in the office hour.

- 1) Selma makes 36 monthly deposits of \$200 starting from the end of year 1, in a savings account at a Bank which pays nominal interest of 24% per year compounded monthly. Three years after making the last deposit, the nominal interest rate changes to 16% compounded quarterly. If the accumulated money is withdrawn from the bank at the end of year 10, how much is withdrawn?
- 2) A loan company offers money at 1.8% per month, compounded monthly.
 - (a) What is the nominal interest rate?
 - (b) What is the effective annual interest rate?
 - (c) How many years will it take an investment to triple if interest is compounded monthly?
- 3) Determine the present worth of a geometric gradient series with a cash flow of \$50,000 in year 1 and increases of 6% each year through year 8. The interest rate is 10% per year.
- 4) Beth wants to buy a bar called Puzzle that will cost \$80,000. She will make a down payment of \$10,000 and take out a mortgage on the rest of the money at 9% compounded monthly.
 - a. What will be her monthly payments to retire the mortgage in 4 years?
 - b. Beth has made 8 payments and wants to figure out the remaining balance immediately after 8th payment. What is that balance?

- 5) Consider the accompanying cash flow diagram, which represents three different interest rates applicable over the five-year time span shown



- (a) Calculate the equivalent amount P at the present time.
- b) Calculate the single-payment equivalent to F at $n=5$
- (c) Calculate the equal-payment-series cash flow A that runs from $n=1$ to $n=5$

6) Serkan wants to sell a bond that has a face value of \$1,000. The bond bears a nominal interest rate of 8%, with bond interests payable semiannually. Four years ago, \$920 was paid for the bond. At least a 9% return (yield) on the investment is desired. What must be the minimum selling price?

7) A Company has two bond issues outstanding. Both bonds pay \$100 semiannual interest, plus \$1,000 at maturity. Bond A has a remaining maturity of 15 years, bond B a maturity of 1 year. What is the value of each of these bonds today, when the market interest rate is 9%?

8) A restaurant is considering purchasing a lot adjacent to its business to provide adequate parking space for its customers. The restaurant needs to borrow \$35,000 to secure the lot. A deal has been made between a local bank and the restaurant so that the restaurant would pay the loan back over a five-year period with the following payment terms: 15%, 20%, 25%, 30%, and 35% of the initial loan at the end of first, second, third, fourth, and fifth years, respectively.

(a) What rate of interest is the bank earning from this loan?

(b) What would be the total interest paid by the restaurant over the five-year period?

9) Ali is planning to make two deposits: \$25,000 now and \$30,000 at the end of year 6. He wants to withdraw C each year for the first six years and $(C+1000)$ each year for the next six years. Determine the value of C if the deposits earn 10% interest compounded annually.

10) A fisher borrowed \$25,000 from a bank at an interest rate of 10% compounded monthly. The loan will be repaid in 36 equal monthly installments over three years. Immediately after his 20th payment, he desires to pay the remainder of the loan in a single payment. Compute the total amount he must pay.

11) A car Company is advertising a 24-month lease of a car for \$520, payable at the beginning of each month. The lease requires a \$2,500 down payment, plus a \$500 refundable security deposit. As an alternative, the company offers a 24-month lease with a single up-front payment of \$12,780, plus a \$500 refundable security deposit. The security deposit will be refunded at the end of the 24-month lease. Assuming an interest rate of 6%, compounded monthly, which lease is the preferred one?