

**IE 342 18-19 Spring**

**Study Set 2**

**Please do not submit your answers as they will not be graded!!  
(Solutions will not be provided)**

- 1) Selma makes 36 monthly deposits of \$200 starting from the end of year 1, in a savings account at a Bank which pays 24% compounded monthly. Three years after making the last deposit, the 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 If the accumulated money is withdrawn from the bank at the end of year 10, how much is withdrawn? Assume that payments made within the compounding period receives partial interest.

Answer: \$62,158.015

- 2) 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 pay off the mortgage in 20 years?

- b. Beth has made 28 monthly payments and wants to figure out the remaining balance immediately after the 28<sup>th</sup> payment. What is that balance?

Answer: a) \$630 b) \$66,768.30

- 3) Serkan wants to sell a bond that has a face value of \$1,000. The bond has a coupon rate of 6% payable semiannually. Five years ago, he paid \$880 for the bond. Serkan requires at least a 8% return (yield) on this investment. What must be the minimum selling price?

Answer: \$942.47

- 4) 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 of the bonds is 9%?

Answer:

Bond A : \$1895.89

Bond B: \$1103

- 5) A car company is advertising a 24-month lease of a car for \$520/month. The lease requires a \$2,500 down payment and a \$400 disposition fee paid at the end of the lease. 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 (as \$500) at the end of the 24-month lease. Assuming an interest rate of 6%, compounded monthly, which lease is more preferable?

Answer: Option 2

- 6) The Green Cable Corporation issued a new series of bonds on January 1, 2010. The bonds were at par (\$1,000), have a 12% coupon rate and mature in 30 years in December 31, 2039. Coupon interest payments are made semiannually on June 30 and December 31.

a. What was the yield to maturity of the bond on January 1, 2010?

b. Assuming that market interest rate on bonds had fallen to 9%, what was the price of the bond on January 1, 2015?

- c. On July 1, 2015, the bonds sold for \$922.38. What was the yield to maturity at that date?  
 d. What was the current yield on that date?

Answer:

- a) effective annual interest rate = 12.36 %
- b) \$1296.43
- c) effective annual interest rate = 13.488 %
- d) effective annual yield = 13.43 %

- 7) A house can be purchased for \$155,000, and you have \$25,000 cash for a down payment. You are considering the following two financial options:

Option 1: Getting a new standard mortgage with a 7.5% (APR) interest and a 30-year term.

Option 2: Assuming the seller's old mortgage, which has an interest rate of 5.5% (APR), a remaining term of 25 years (the original term was 30 years), a remaining balance of \$97,218, and payments of \$597 per month. You can obtain another mortgage for the \$32,782 from your credit union at 9% (APR) with a 10 years repayment period.

- a. Compute the monthly payments for each option over the life of the mortgage.
- b. Compute the total interest payment for each option.

Answer:

- a)  $A_1 = \$908.97$   
 $A_2 = \$1012.27$  for 120 months, \$597 for 180 months
- b)  $I_1 = \$197,229.2$   
 $I_2 = \$98,932.2$

- 8) Mr. Smith wants to buy a new car that will cost \$26,000. He will make a down payment in the amount of \$10,430. He would like to borrow the remainder from a bank at an interest rate of 12% compounded monthly. He agrees to pay off the loan monthly for a period of three years.

- a. What is the amount of monthly payment?
- b. What is the balance remaining immediately after 18th payment? What is the interest and principal payments of the 18th payment?

Answer:

- a) \$517.15
- b) \$8,480.36, \$89.08, \$428.07

- 9) Consider the following two options for financing a car:

Option A. Purchase the vehicle at the normal price of \$26,200 and pay for the vehicle over three years with equal monthly payments at 1.9% APR financing.

Option B. Purchase the vehicle for a discount price of \$24,048 to be paid immediately.

The funds that would be used to purchase the vehicle are presently earning 5% annual interest compounded monthly. Which option is preferable?

Answer : Choose Option B

- 10) Suppose that you finance a home on the basis of mortgage plan over 25 years which has adjustable interest rate through determined years as shown in the table below. The \$100,000 hybrid loan plan offers an initial rate of 5.05% fixed for 96 months. There is no prepayment penalty for this type of loan. The projected interest rates by the lender after 8 years are as follows:

| Period    | Projected APR |
|-----------|---------------|
| Years 1–8 | 5.05%         |
| Year 9    | 5.25%         |
| Year 10   | 5.32%         |
| Year 11   | 5.40%         |
| Year 12   | 5.50%         |

- Develop the payment schedule for the first 12 years.
- Find out ending loan balance at the end of year 12.
- Determine the total interest paid over a 12-year ownership.
- For this payment schedule, what equal end-of-the-month payment for the first 12 years would be required to repay the same amount of the loan with interest 5.05%?

Answer:

- $A_{1-96} = \$587.51$   
 $B_{96} = \$80,334.87$   
 $A_{96-108} = \$351.52$   
 $B_{108} = \$45,596.99$   
 $A_{108-120} = \$353.22$   
 $B_{120} = \$32,815.99$   
 $A_{120-132} = \$266.40$   
 $B_{132} = \$31,356$   
 $A_{132-144} = \$268.04$
- $B_{144} = \$29,826.02$
- $\$1097.14$
- $\$361.036$

- 11) ASUS is selling stocks at a price of 82 TL per share at the end of year 2018. The expected dividend in 2018 is 4 TL and the dividend payments are expected to increase by 2.5% for five years (increases by 2.5% in each year). The expected stock price in 3 years will be 101 TL per share. You expect 9% on your investment. By considering 3 years only, would you buy the stock or not? Why?

Answer : Stock is underpriced, Buy the stock