FIN 3710
First (Practice) Midterm Exam 03/09/06

NAME: ______________________________
(Please print your name here)

PLEDGE: ____________________________
(Sign your name here)

Instructions:

1. The exam is closed book and closed notes. You can bring in one page, single-sided, 8×11 formula sheet.

2. You can (and probably have to) use a calculator.

3. You have a total of 60 minutes for the exam.

4. The whole exam has a total of 20 points. It will count 20% for your final course grade. There are total of 20 multiple choices questions.

5. Do not separate the exam book. Turn in the entire exam at the end.

6. Budgeting your time efficiently.

7. Good luck.
Please use the following table for your answer to the multiple choice questions

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1. An investor purchases one municipal and one corporate bond that pay rates of return of 8% and 10% respectively. If the investor is in the 15% tax bracket, his after tax rates of return on the municipal and corporate bonds would be respectively
A) 6.4% and 8%
B) 6.8% and 10%
C) 8% and 8.5%
D) 8% and 10%

2. You observe in the market that one year CD offers a yield of 3%, while a two-year CD offers a yield of 3.5%. What is the one year forward rate ($f_{1,2}$)?
A) 3.0%
B) 3.5%
C) 4.0%
D) 6.5%

3. Consider the liquidity preference theory of the term structure of interest rates. On average, one would expect investors to require _________.
A) a higher yield on short term bonds than long term bonds
B) a higher yield on long term bonds than short term bonds
C) the same yield on both short term bonds and long term bonds
D) the liquidity preference theory cannot be used to make any of the above statements.

4. A coupon bond which pays interest of $40 annually, has a par value of $1,000, matures in 5 years, and is selling today at a $159.71 discount from par value. The yield to maturity on this bond is _________.
A) 5%
B) 6%
C) 7%
D) 8%

5. A coupon bond which pays interest of $50 annually, has a par value of $1,000, matures in 5 years, and is selling today at a $84.52 discount from par value. The current yield on this bond is _________.
A) 5%
B) 5.46%
C) 5.94%
D) 6.00%

6. A callable bond pays annual interest of $60, has a par value of $1,000, matures in 20 years but is callable in 10 years at a price of $1,100, and has a value today of $1055.84. The yield to call on this bond is _________.
A) 6.00%
B) 6.58%
C) 7.20%
D) 8.00%
7. A coupon bond which pays interest semi-annually, has a par value of $1,000, matures in 5 years, and has a yield to maturity of 8%. If the coupon rate is 10%, the intrinsic value of the bond today will be __________.
   A) $855.55  
   B) $1,000  
   C) $1,081  
   D) $1,100

8. You purchased a 5-year annual interest coupon bond one year ago. Its coupon interest rate was 6% and its par value was $1,000. At the time you purchased the bond, the yield to maturity was 4%. If you sold the bond after receiving the first interest payment and the bond's yield to maturity had changed to 3%, your annual total rate of return on holding the bond for that year would have been __________.
   A) 5.00 – 6.00 %  
   B) 6.01 – 7.00 %  
   C) 7.01 – 8.00 %  
   D) 8.01 – 9.00 %

9. Consider a 7-year bond with a 9% coupon and a yield to maturity of 12%. If interest rates remain constant, one year from now the price of this bond will be __________.
   A) higher  
   B) lower  
   C) the same  
   D) cannot be determined

10. You wish to earn a return of 10% on each of two stocks, A and B. Each of the stocks is expected to pay a dividend of $4 in the upcoming year. The expected growth rate of dividends is 6% for stock A and 5% for stock B. Using the constant growth DDM, the intrinsic value of stock A __________.
    A) will be higher than the intrinsic value of stock B  
    B) will be the same as the intrinsic value of stock B  
    C) will be less than the intrinsic value of stock B  
    D) more information is necessary to answer this question

11. You are considering acquiring a common share of Sahali Shopping Center Corporation that you would like to hold for one year. You expect to receive both $1.25 in dividends and $35 from the sale of the share at the end of the year. The maximum price you would pay for a share today is __________ if you wanted to earn at least a 12% return.
    A) $31.25  
    B) $32.37  
    C) $38.47  
    D) $41.32

12. The market capitalization rate on the stock of Aberdeen Wholesale Company is 10%. Its expected ROE is 12% and its expected EPS is $5.00. If the firm's plow-back ratio is 40%, its P/E ratio will be __________.
13. Brevik Builders has an expected ROE of 25%. Its dividend growth rate will be ________ if it follows a policy of paying 30% of earning in the form of dividends.
   A) 7.5%
   B) 15.0%
   C) 17.5%
   D) 45.0%

14. Grott and Perrin, Inc. has expected earnings of $3 per share for next year. The firm's ROE is 20% and its earnings retention ratio is 70%. If the firm's market capitalization rate is 15%, what is the present value of its growth opportunities?
   A) $20
   B) $70
   C) $90
   D) $115

15. Lifecycle Motorcycle Company is expected to pay a dividend in year 1 of $2.00, a dividend in year 2 of $3.00, and a dividend in year 3 of $4.00. After year 3, dividends are expected to grow at the rate of 7% per year. An appropriate required return for the stock is 12%. Using the multistage DDM, the stock should be worth __________ today.
   A) $63.80
   B) $65.13
   C) $67.95
   D) $85.60

Use the following to answer questions 16-18:

   ART has come out with a new and improved product. As a result, the firm projects an ROE of 25%, and it will maintain a plowback ratio of 0.20. Its earnings this year will be $3 per share. Investors expect a 12% rate of return on the stock.

16. At what price would you expect ART to sell now?
   A) $25.00
   B) $34.29
   C) $42.86
   D) none of the above

17. What is the present value of growth opportunities for ART?
   A) $8.57
   B) $9.29
   C) $14.29
   D) none of the above
18. What price do you expect ART shares to sell for in 4 years?
   A) $53.96
   B) $44.95
   C) $41.68
   D) None of the above

Use the following to answer questions 19-20:

Bond A is a one-year zero coupon bond selling at $900.
Bond B is a two-year bond with annual coupon at 20% coupon rate, and selling at $1080
Bond C is a two-year zero coupon bond

All three bonds have a face value of $1000.

19. To eliminate arbitrage opportunity, what should be the price of bond C based on
    information about bond A and bond B?
   A) $ 700.00 - $ 800.00
   B) $ 800.01 - $ 900.00
   C) $ 900.01 - $1000.00
   D) > $1000.00

20. Which bond out of the three have the highest YTM?
    A) Bond A
    B) Bond B
    C) Bond C
    D) They are the same

For additional practice questions, please study the examples in your lecture notes and the
questions in HW1 and HW2.

Suggested answers: CCBD B ACCA BBCBC BBCAC
Suggested Solutions:

Q1. After tax yield for corporate bond = (1-15%) 10% = 8.5%
    After tax yield for municipal bond = (1-0%) 8% = 8%

Q2. \( s_1=3\% \); \( s_2=3.5\% \); \( f_{1,2}=(1+s_2)^{2}/(1+s_1) - 1 = 4\% \)

Q4. today’s price = 1000 – 159.71 = 840.29
    \[ 840.29 = 40r[1-1/(1+r)^5] + 1000/(1+r)^5 \]
    \( r = 8\% \)

Q5. current yield = 50 / (1000 – 84.52) = 5.46%

Q6. \( 1055.84 = 60/ytce[1-1/(1+ytce)^{10}] + 1100/(1+ytce)^{10} \) \( \Rightarrow ytc = 6\% \)

Q8. total return comes from coupon and capital gain. First find out the price that you paid to buy:
    \[ V = 60/0.04[1-1/(1+0.04)^{5}] + 1000/(1+0.04)^{5} \] \( \Rightarrow V = 1,089 \)
    Then find out the price that you can sell for: \( V = 60/0.03[1-1/(1+0.03)^{4}] + 1000/(1+0.03)^{4} \) \( \Rightarrow V = 1,111.5 \)
    Total return = (1111.5+60-1089)/1089 = 7.58%

Q9. The price of a discount bond will converge to par over time

Q11. \( E[HPR] = 12\% = (35+1.25) / P -1. \Rightarrow P = (35+1.25) / (1+12\%) = 32.37 \)

Q12. Needs to find out P to calculate P/E.
    \( g = ROE*b = 12\% * 0.4 = 4.8\% \)
    \( D1 = E1 * (1-b) = 3 * (1-40\%) = 3 \)
    \( P = D1 / (k-g) = 3 / (0.10 - 0.48) = 57.69 \)
    \( P/E = 57.69 / 5 = 11.54 \)

Q13. \( g = ROE * b = 25\% (1 – 30\%) = 17.5\% \)

Q14. \( PVGO \) is the difference between value with growth and value without growth
    With growth: \( g=20\% * 70\% = 14\%; D1 = 3 * 0.3 = 0.9 \)
    \( V_{Growth} = 0.9 / (15\%-14\%) = 90 \)
    Without growth (pay out all earning as dividend): \( g=20\% * 0\% = 0\%; D1 = 3 \)
    \( V_{NoGrowth} = 3 / 15\% = 20 \)
    \( PVGO = 90 – 20 = 70 \)

Q15. \( V3 = D3(1+g) / (k-g) = 4 * (1+0.07) / (0.12 – 0.07) = 85.6 \)
    \( V0 = PV(D1, D2, D3+V3) = 2/1.12 + 3/1.12^2 + (4+85.6)/1.12^3 = 67.95 \)

Q16. \( g = ROE * b = 25\% * 0.2 = 5\% \)
    \( D1 = E1 * (1-b) = 3 * (1-0.2) = 2.4 \)
    \( V_{Growth} = D1/(k-g) = 2.4 / (0.12 - 0.05) = 34.29 \)

Q17. Without growth \( D1 = E1 = 3 \)
    \( V_{NoGrowth} = 3 / 0.12 = 25 \)
    \( PVGO = 34.29 – 25 = 9.29 \)

Q18. \( V4 = D5/(k-g) = D1(1+g)^{4}/(k-g) = V0*(1+g)^{4} = 34.29 * (1+0.05)^{4} = 41.68 \)

Q19. Based on price of bond A: \( d1*1000 = 900 \) \( \Rightarrow d1=0.9 \)
    Based on price of bond B: \( d1*200 + d2*1200 = 1080 \) \( \Rightarrow d2=0.75 \)
    Use d2 to price bond c: \( Pc=1000*0.75 = $750 \)

Q20. \( s_1 = 1/d1 – 1 = 11.1\%; s_2 = (1/d2)^{0.5} – 1 = 15.5\%; ytm for B is in between s1 and s2. \)