

***Multiple choice – 3 points each – 30 points total***

1. You buy a house for \$200,000 on a 30-year fixed rate mortgage. Instead of a traditional mortgage, you take out a bi-weekly mortgage. The payments for the bi-weekly mortgage are one-half of the payments you would have made on the monthly payment schedule and are made once every 2 weeks instead of once per month. The APR for both mortgages is 5.2 percent. How many months sooner will you pay off the bi-weekly mortgage compared to the monthly mortgage?
  - A. 60 months
  - B. 117 months
  - C. 42 months
  - D. 79 months
  - E. It will take 30 years to pay off either mortgage.
  
2. If its yield to maturity is more than its coupon rate, a bond will sell at a \_\_\_\_\_, and decreases in market interest rates will \_\_\_\_\_.
  - A. discount; decrease this discount
  - B. discount; increase this discount
  - C. premium; decrease this premium
  - D. premium; increase this premium
  - E. None of the above.
  
3. If a firm's debt-to-equity ratio is 0.5, what is its total debt to total asset ratio?
  - A. 0.25
  - B. 0.33
  - C. 0.50
  - D. 0.75
  - E. 0.80
  
4. The yield to maturity is:
  - A. the rate that equates the price of the bond with the discounted cash flows.
  - B. the expected rate to be earned if held to maturity.
  - C. equal to the current yield for bonds priced at par.
  - D. the rate that is used to determine the market price of the bond.
  - E. All of the above.
  
5. \_\_\_\_\_ returns measure the percentage change in purchasing power, i.e., the change in the standard of living.
  - A. Holding period
  - B. Nominal
  - C. Real
  - D. Inflation
  - E. Capital gain

6. You purchase a car for \$45,000 with a 60 month contract and a 9% APR. If the loan contract is in the form of an annuity due, what is your monthly payment?
- A. \$927.17
  - B. \$934.13
  - C. \$941.82
  - D. \$948.65
  - E. \$956.31
7. Protective covenants are designed to protect:
- A. stockholders.
  - B. bondholders.
  - C. company management.
  - D. financial regulators.
  - E. stock markets.
8. If the total assets of firm decrease while all other components of ROE remain unchanged, you would expect the firm's:
- A. ROE to increase.
  - B. ROE to decrease.
  - C. ROE to remain unchanged.
  - D. Equity multiplier to increase.
  - E. Profit margin to decrease.
9. Vito Corleone will loan you money on a "four-for-five arrangement"; i.e., for every \$4 he gives you today, you owe him \$5 in one week. What is the EAR of the loan?
- A. 250%
  - B. 869%
  - C. 1,095%
  - D. 109,475%
  - E. 10,947,544%
10. The term structure of interest rates may be downward sloping if:
- A. the interest rate risk premium is the same for both short- and long-term bonds.
  - B. the inflation premium decreases with maturity.
  - C. the real rate is lower this year than last year.
  - D. default risk premiums are higher for longer terms bonds than shorter term bonds.
  - E. the bonds are risk-free.

**Partial Credit Problems --- SHOW ALL WORK**

**Problem 1 (10 points)** Dr. Joe Schmo is a finance professor at a small Southern liberal arts university. A student who has performed poorly in the introductory finance class has offered to pay Dr. Schmo for a better grade. Dr. Schmo presented the student with this agreement to sell a better grade: Since he would be fired from his position, he would lose his salary and benefits. His salary is \$55,000 per year, paid in equal payments at the end of the each month. His salary is expected to keep pace with inflation. You may assume the monthly salary payments increase at the inflation rate. His benefits amount to \$20,000 per year, and the benefit payments occur at the beginning of each year. The benefits will also increase at the rate of inflation. He expects to work for another 25 years. Assume the required return is 7 percent nominal and the inflation rate is 3.5 percent. All rates are effective annual rates. Dr. Schmo will sell the student a better grade if the student pays the present value of the future lost salary and benefits. How much will the student have to pay for a better grade?

**Problem 2 (11 points)** In January 1984, Richard “Goose” Gossage signed a contract to play for the San Diego Padres that guaranteed him a minimum of \$9,955,000. The guaranteed payments were \$875,000 for 1984, \$650,000 for 1985, \$800,000 in 1986, \$1 million in 1987 and 1988 and \$300,000 in 1989. In addition, he would be paid \$240,000 per year from 1990 through 2006 and then \$125,000 per year from 2007 through 2016. If the effective annual rate of return is 9 percent and all payments are made on July 1, what is the present value of these guaranteed payments on January 1, 1984? If he were to receive an equal annual salary for the five years from 1984 through 1988, what would the payments be assuming they were made at the end of the year?

**Problem 3 (11 points)** You have just won the Oddball Lottery. Dewey, Cheatum, and Howe Capital Funding has just offered you \$8.31 million today in exchange for your payments. The lottery payments are unusual, to say the least. You will receive payments of \$750,000 one year from today and two years from today years, then a payment of \$900,000 three years from today. These payments will be repeated 20 times for a total of 60 payments. In other words, you will also receive \$750,000 in four years and five years, and \$900,000 in year six, and so on. Should you accept the offer if the interest rate is a 10 percent APR compounded monthly? Note: There are too many cash flows to use the cash flow worksheet in the calculator.

**Problem 4 (12 points)** You want to retire in 25 years. Currently, you have \$30,000 invested in a bond account and \$50,000 invested in a stock account. The bond account will earn an 8% EAR and the stock account will earn a 12% EAR. You also plan to deposit \$1,000 a month for the next 15 years into the stock account and then \$1,000 a month for the last 10 years into your bond account. When you retire you plan to move all of your money into an account that earns a 9% EAR. You plan to live for 25 years after you retire. Additionally, at the end of your retirement you want to leave \$1,000,000 for your grandchildren. How much can you withdraw each month?

**Problem 5 (8 points)** Assume the firms below issue bonds with the following characteristics. Both bonds are issued at par.

	<u>ABC bonds</u>	<u>XYZ bonds</u>
Issue size	\$1.2 billion	\$150 million
Maturity	10 years <sup>1</sup>	20 years
Coupon	9%	10%
Collateral	First mortgage	General debenture <sup>2</sup>
Callable	Not callable	In 10 years
Call price	None	110
Sinking fund	None	Starting in 5 years

<sup>1</sup>Bond is extendible at the discretion of the bondholder for an additional 10 years.

<sup>2</sup>A general debenture is secured by the creditworthiness of the firm and has no priority of payment in default.

Assuming the credit quality of the two bond issues are the same, identify four features of each of these issues that might account for a lower coupon rate for ABC. Why would each of these features be important?

**Problem 6 (8 points)** What is the price of the Treasury bond listed below? Did interest rates move up or down on this day?

Rate	Maturity Mo./Yr.	Bid	Asked	Chg	Ask Yld.
7.375	Feb36			+6	4.82

**Problem 7 (10 points)** The most recent financial statements for Storico Industries follow. Sales for next year are projected to grow by 12 percent. Interest expense will remain constant; the tax rate and the dividend payout rate will also remain constant. Costs, other expenses, current assets, and accounts payable increase spontaneously with sales. The firm is operating at full capacity and any increase in fixed assets requires a \$5 million investment to start a new production line. Show the pro forma financial statements for next year. What is the external financing needed to support the 12 percent growth rate in sales?

Sales	\$30,499,420
COGS	22,224,580
Other expenses	<u>3,867,500</u>
EBIT	\$4,407,340
Interest	<u>478,240</u>
Taxable income	\$3,929,100
Taxes (40%)	<u>1,571,640</u>
Net income	<u><u>\$2,357,460</u></u>
Dividends	\$1,414,476
Add to RE	\$942,984

Assets		Liabilities & Equity	
Current Assets		Current liabilities	
Cash	\$ 441,000	Accounts payable	\$ 889,000
Accounts rec.	708,400	Notes payable	<u>2,030,000</u>
Inventory	<u>1,037,120</u>	Total CL	\$2,919,000
Total CA	\$2,186,520		
		Long-term debt	\$5,320,000
Fixed assets		Shareholder equity	
Net PP&E	<u>\$16,122,400</u>	Common stock	\$ 350,000
		Retained earnings	<u>9,719,920</u>
		Total equity	<u>\$10,069,920</u>
Total assets	<u>\$18,308,920</u>	Total L&E	<u>\$18,308,920</u>

**Answer Key****FIN 6100****EXAM #1****Spring 2009**

1. A
2. A
3. B
4. E
5. C

6. A
7. B
8. C
9. E
10. B

**Problem #1**

$$(1 + R) = (1 + r)(1 + h); (1 + .07) = (1 + r)(1 + .035); r = 3.381642512\%$$

Enter

3.38%

12

**NOM****EFF****C/Y**

Solve for

3.33033%

PV of salary:

Enter

25 × 12

3.33033%/12

\$55,000/12

**N****I/Y****PV****PMT****FV**

Solve for

\$932,385.89

PV of benefits:

Enter

24

3.3816%

\$20,000

**N****I/Y****PV****PMT****FV**

Solve for

\$325,196.71

$$PV = \$932,385.89 + 325,196.71 + 20,000 = \$1,277,682.60$$



#### Problem #4

Bond APR = 7.720836132%

Stock APR = 11.38655152%

Retirement APR = 8.648787979%

At retirement you will have in the bond account:

Enter	15	8%	\$30,000		
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for					\$95,165.07

Enter	10 × 12	7.72%/12	\$95,165.07	\$1,000	
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for					\$385,578.53

You will have in the stock account:

Enter	15 × 12	11.39%/12	\$50,000	\$1,000	
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for					\$745,136.12

Enter	10	12%	\$745,136.12		
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for					\$2,314,279.69

You have  $\$385,578.53 + 2,314,279.69 = \$2,699,858.22$

You need to save this amount to have \$1M

Enter	25	9%			\$1,000,000
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for			\$115,967.84		

You have  $\$2,699,585.22 - 115,967.84 = \$2,583,890.38$  left

Enter	25 × 12	8.65%/12	\$2,583,890.38		
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for				\$21,063.67	

Alternatively:

Enter	25 × 12	8.65%/12	\$2,699,585.22		-\$1,000,000
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for				\$21,063.67	

#### Problem #5

- 1) XYZ bonds have a longer maturity, consistent with an upward sloping yield curve, therefore a higher coupon.
- 2) The XYZ bond is a general debenture, while the ABC bond has a mortgage collateral. The presence of collateral should lower the coupon rate since the bondholders have claim to the collateral.
- 3) The XYZ bond is callable. A callable bond benefits the company, increasing the coupon rate.
- 4) The ABC bond is extendible at the discretion of the bondholder, a benefit for the bondholder requiring a lower coupon rate.

**Problem #6**

Enter	54	2.41%		\$36.875	\$1,000
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for			\$1,383.58		

Since the price increased, interest rates decreased.

**Problem #7**

Dividend payout ratio = 0.60

## Pro Forma Income Statement

Sales	\$ 34,159,350
Costs	24,891,530
Other expenses	<u>4,331,600</u>
EBIT	\$ 4,936,221
Interest expense	<u>478,240</u>
Taxable income	\$ 4,457,981
Taxes	<u>1,783,192</u>
Net income	\$ 2,674,788

Dividends	\$ 1,604,873
Add. To RE	\$ 1,069,915

Assets		Liabilities and owners' equity	
Current assets		Current liabilities	
Cash	\$ 493,930	Accounts payable	\$ 995,680
Accounts receivable	793,408	Notes payable	<u>2,030,000</u>
Inventory	<u>1,161,574</u>	Total	\$ 3,025,680
Total	\$ 2,448,902	Long-term debt	5,320,000
Fixed assets		Owners' equity	
Net plant and equipment	<u>21,122,400</u>	Common stock and paid-in surplus	\$ 350,000
		Retained earnings	<u>10,7889,835</u>
		Total	<u>\$11,139,835</u>
Total assets	\$ 23,571,302	Total liabilities and owners' equity	\$19,485,515

EFN = \$23,571,302 – 19,485,515 = \$4,085,787