

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

1. 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
  
2. You take out a mortgage on a \$150,000 house for 30 years with an interest rate of 9% and monthly payments. If you decide to sell the house in 16 years and pay off the mortgage, what is your final payment assuming all monthly payments were made exactly on time?
  - A. \$88,321
  - B. \$93,806
  - C. \$98,415
  - D. \$106,320
  - E. \$115,063
  
3. What does a total asset turnover of 1.5 times mean?
  - A. For each \$1 of sales generated, the firm has total assets of \$1.50.
  - B. For each \$1 of total assets, the firm generated sales of \$1.50.
  - C. For each \$1 of total assets, the firm generated \$1.50 in net income.
  - D. For each \$ of net income generated, the form has \$1.50 in total assets.
  - E. The firm completely replaces its fixed assets 1.5 times a year on average.
  
4. All else the same, which of the following occurs when a firm buys inventory with cash?
  - A. The quick ratio goes up if it was greater than one before the purchase.
  - B. The current ratio goes up if it was greater than one before the purchase.
  - C. The quick ratio goes down if it was greater than one before the purchase.
  - D. The current ratio goes down if it was greater than one before the purchase.
  - E. The quick ratio declines but the current ratio remains unchanged.
  
5. What does the receivables period (days' sales in receivables ratio) measure?
  - A. The number of days it takes to generate dollar sales equal to the outstanding receivables.
  - B. The number of times a year the firm collects its receivables and renews its receivables.
  - C. The number of days in a year the firm's working capital becomes negative.
  - D. The number of days it would take to collect outstanding receivables if no new ones are created.
  - E. The number of days a firm takes to pay its bills assuming no new ones are created.

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. Which of the following will increase the amount of the cash flow to creditors?
- A. A new long-term loan.
  - B. The early payment of an accounts payable.
  - C. An early payoff of a long-term loan.
  - D. A decrease in the rate of interest charged on a loan.
  - E. The payment of a cash dividend.
9. Last year a firm had a profit margin of 7%. This year the profit margin is 6%. Sales remained constant. Which one of the following statements is correct based on this information?
- A. The return on assets declined.
  - B. The return on equity increased.
  - C. The net income increased.
  - D. The price earnings ratio decreased.
  - E. The interval measure decreased.
10. Dorr Corp. had an ROA of 8 percent. Dorr's net profit margin was 4 percent on sales of \$250. What were total assets?
- A. \$30
  - B. \$64
  - C. \$125
  - D. \$224
  - E. \$317

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

**Problem 1 (11 points)** You have just won the Life's Downhill after 30<sup>TM</sup> lottery. The lottery payments will be made for the next 30 years. The payments are slightly unusual in that you will be paid \$600,000 every six months starting six months from today for a total of 60 payments. You will also receive \$900,000 every nine months starting nine months from today for a total of 40 payments. When the payments coincide, for example 18 months from today, you will receive both payments. If the interest rate is 0.7 percent per month, what is the present value of your winnings?

**Problem 2 (11 points)** You have just won the Joe Smo lottery. Your payments are in the form of an increasing perpetuity. One year from today you will receive \$25,000, and the payments will increase at \$25,000 per year. Thus, in 2 years you will receive \$50,000, in 3 years you will receive \$75,000, and so on. If the interest rate is an 8 percent APR compounded monthly, what is the value of your windfall today?

**Problem 3 (13 points)** You want to withdraw \$7,000 per month in real terms for 25 years when you retire. You plan to retire in 35 years, and expect to earn a 12 percent nominal effective annual return before you retire. You will make monthly deposits to fund your retirement account. Immediately after you make your last deposit, you plan to withdraw \$20,000 in real terms to take an around the world trip. You also wish to leave your grandchildren \$500,000 in real terms at the end of the 25 years of withdrawals. You will earn an 8 percent effective annual nominal return after you retire. The inflation rate over the entire period is expected to be an effect annual rate of 3.8 percent. What is the real amount of you monthly deposit? How much will your account be worth in nominal terms immediately after your last deposit?

**Problem 4 (8 points)** What is the yield to maturity of the following bond? What is the yield to maturity of the comparable U.S. Treasury bond?

<b>Company (Ticker)</b>	<b>Coupon</b>	<b>Maturity</b>	<b>Last Price</b>	<b>Last Yield</b>	<b>EST Spread</b>	<b>UST</b>	<b>Est Vol (000's)</b>
Yum! Brands (YUM)	8.875	Sep 23, 2017	117.688		226	10	5,532

**Problem 5 (10 points)** Following are the abbreviated financial statements for a company:

<b>Balance Sheet</b>						<b>Income Statement</b>	
	<b>2007</b>	<b>2008</b>		<b>2007</b>	<b>2008</b>		
Current assets	\$653	\$707	Current liab.	\$261	\$293	Sales	\$8,280
Fixed assets	2,691	3,240	Long-term debt	1,422	1,512	Costs	3,861
						Depreciation	738
						Interest	211

- a. What is owners' equity for each year?
- b. What is the change in net working capital for 2008?
- c. In 2008, the company purchased \$1,350 in new fixed assets. How much in fixed assets did the company sell? If the tax rate is 35 percent, what is the cash flow from assets?
- d. During 2008, the company raised \$270 in new long-term debt. How much in long-term debt did the company pay off during the year? What is the cash flow to creditors?

**Problem 6 (5 points)** In class, we discussed that in a U.S. Treasury bond quote, the Asked Yield is shown on the quote. A YTM could also be calculated on the Bid price. Is there a definite relationship between the Bid Yield and Asked Yield? In other words, is one always higher than the other, can one be higher for one bond and lower for another bond, or can they be/are they the same? Why?

**Problem 7 (12 points)** The most recent financial statements a company are shown below. Sales for next year are projected to grow by 20 percent. Interest expense and depreciation 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. Suppose the company is operating at 90 percent capacity and wishes to increase its sales by 20 percent. Further, the company can only increase its fixed assets in increments of \$45 million. Prepare the pro forma financial statements and calculate the EFN.

Sales	\$198,000,000
COGS	108,600,000
Other expenses	21,500,000
Depreciation	<u>10,500,000</u>
EBIT	\$57,400,000
Interest	<u>4,350,000</u>
Taxable income	\$53,050,000
Taxes	<u>21,220,000</u>
Net income	\$31,830,000

Dividends	\$19,098,000
Add to RE	\$12,732,000

Assets		Liabilities & Equity	
Current assets		Current liabilities	
Cash and equivalents	\$1,358,000	Accounts payable	\$2,400,000
Accounts receivable	4,180,000	Notes payable	<u>1,870,000</u>
Inventories	<u>8,753,000</u>	Total current liabilities	\$4,270,000
Total current assets	\$14,291,000		
		Long-term debt	\$47,500,000
		Stockholders' equity	
Total fixed assets	<u>\$93,580,000</u>	Common stock	8,000,000
		Accumulated retained earnings	<u>48,101,000</u>
		Total equity	\$56,101,000
		Total liabilities and	
Total assets	\$107,871,000	shareholders' equity	\$107,871,000

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

- |      |       |
|------|-------|
| 1. B | 6. A  |
| 2. E | 7. B  |
| 3. B | 8. C  |
| 4. E | 9. A  |
| 5. D | 10. C |

**Problem #1**

This is simply the PV of two annuities. The effective six month interest rate is:

$$(1 + .007)^6 - 1 = 4.274\%$$

The present value of the \$600,000 annuity is:

Enter	60	4.274%		\$600,000	
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for			\$12,898,317.68		

The effective nine month interest rate is:

$$(1 + .007)^9 - 1 = 6.479\%$$

Enter	40	6.479%		\$900,000	
	<b>N</b>	<b>I/Y</b>	<b>PV</b>	<b>PMT</b>	<b>FV</b>
Solve for			\$12,762,896.35		

So, the total present value of your winnings is:

$$\$12,898,317.68 + 12,762,896.35 = \$25,661,214.03$$

**Problem #2**

Enter	8%		12
	<b>NOM</b>	<b>EFF</b>	<b>C/Y</b>
Solve for		8.29995%	

The value today of the perpetuity of \$25,000 beginning in one year is:

$$PV = \$25,000 / .0829995 = \$301,206.61$$

Notice, this is also the value in Year 1 of the \$25,000 perpetuity beginning in Year 2, the value in Year 2 of the \$25,000 perpetuity beginning in Year 3, etc. So, the present value of the perpetuities are a perpetuity themselves. The value today of the perpetuities beginning in Year 2 and beyond is:

$$PV = \$301,206.61 / .0829995 = \$3,629,016.85$$

Now we can add the value of the perpetuity beginning in Year 1 to find the total value, which is:

$$\text{Value today} = \$301,206.61 + \$3,629,016.85 = \$3,930,223.46$$

**Problem #3**

Real return pre-retirement:  $1 + .12 = (1 + r)(1 + .038)$ ;  $r = 7.8998\%$

Enter                    7.8998%                    12  
                          **NOM**                    **EFF**                    **C/Y**

Solve for            7.627%

Real return post -retirement:  $1 + .08 = (1 + r)(1 + .038)$ ;  $r = 4.0462\%$

Enter                    4.0462%                    12  
                          **NOM**                    **EFF**                    **C/Y**

Solve for            3.9730%

Real savings needed when you retire:

Enter             $12 \times 25$              $3.9730 / 12$                     \$7,000                    \$500,000  
                          **N**                    **I/Y**                    **PV**                    **PMT**                    **FV**

Solve for                                    \$1,515,393.90

Total retirement savings in real terms:

$\$1,515,393.90 + 20,000 = \$1,535,393.90$

Monthly savings amount:

Enter             $35 \times 12$              $7.627 / 12$                     \$1,535,393.90  
                          **N**                    **I/Y**                    **PV**                    **PMT**                    **FV**

Solve for                                    \$733.08

Nominal value of retirement account:

Enter            35                    3.8%                    \$1,535,393.90  
                          **N**                    **I/Y**                    **PV**                    **PMT**                    **FV**

Solve for                                    \$5,664,051.37

**Problem #4**

Enter            16                    \$1,176.88±                    \$88.75/2                    \$1,000  
                          **N**                    **I/Y**                    **PV**                    **PMT**                    **FV**

Solve for                                    3.026%

$YTM = 3.026\% \times 2 = 6.05\%$

The comparable Treasury was 2.26 percent lower, or 3.79%.

**Problem #5**

a. Total assets 2008 =  $\$653 + 2,691 = \$3,344$   
 Total liabilities 2008 =  $\$261 + 1,422 = \$1,683$   
 Owners' equity 2008 =  $\$3,344 - 1,683 = \$1,661$

Total assets 2009 =  $\$707 + 3,240 = \$3,947$   
 Total liabilities 2009 =  $\$293 + 1,512 = \$1,805$   
 Owners' equity 2009 =  $\$3,947 - 1,805 = \$2,142$

b. NWC 2008 =  $CA08 - CL08 = \$653 - 261 = \$392$   
 NWC 2009 =  $CA09 - CL09 = \$707 - 293 = \$414$   
 Change in NWC =  $NWC09 - NWC08 = \$414 - 392 = \$22$

c. We can calculate net capital spending as:  
 Net capital spending = Net fixed assets 2009 – Net fixed assets 2008 + Depreciation  
 Net capital spending =  $\$3,240 - 2,691 + 738 = \$1,287$

So, the company had a net capital spending cash flow of \$1,287. We also know that net capital spending is:

Net capital spending = Fixed assets bought – Fixed assets sold  
 $\$1,287 = \$1,350 - \text{Fixed assets sold}$   
 Fixed assets sold =  $\$1,350 - 1,287 = \$63$

To calculate the cash flow from assets, we must first calculate the operating cash flow. The income statement is:

<i>Income Statement</i>	
Sales	\$ 8,280.00
Costs	3,861.00
Depreciation expense	<u>738 .00</u>
EBIT	\$3,681.00
Interest expense	<u>211 .00</u>
EBT	\$3,470.00
Taxes (35%)	<u>1,215.50</u>
Net income	<u><u>\$2,256.50</u></u>

So, the operating cash flow is:

OCF = EBIT + Depreciation – Taxes =  $\$3,681 + 738 - 1,214.50 = \$3,204.50$

And the cash flow from assets is:

Cash flow from assets = OCF – Change in NWC – Net capital spending.  
 =  $\$3,204.50 - 22 - 1,287 = \$1,895.50$

d.

Net new borrowing	= LTD09 – LTD08 = \$1,512 – 1,422 = \$90
Cash flow to creditors	= Interest – Net new LTD = \$211 – 90 = \$121
Net new borrowing	= \$90 = Debt issued – Debt retired
Debt retired	= \$270 – 90 = \$180

**Problem #6**

Prices and yields move in opposite directions. Since the bid price must be lower than the asked price, the bid yield must be higher than the asked yield.

**Problem #7**

Sales	\$237,600,000
COGS	130,320,000
Other expenses	25,800,000
Depreciation	<u>10,500,000</u>
EBIT	\$70,980,000
Interest	<u>4,350,000</u>
Taxable income	\$66,630,000
Taxes	<u>26,652,000</u>
Net income	\$39,978,000

Dividends	\$23,986,800
Add to RE	\$15,991,200

Full capacity sales = \$198,000,000 / .90  
 Full capacity sales = \$220,000,000

The full capacity ratio at full capacity sales is:

Full capacity ratio = Fixed assets / Full capacity sales  
 Full capacity ratio = \$93,580,000 / \$220,000,000  
 Full capacity ratio = .42536

The fixed assets required at full capacity sales is the full capacity ratio times the projected sales level:

Total fixed assets = .42536(\$237,600,000) = \$101,066,400

Buying one more unit of the lumpy fixed asset will cover the fixed assets requirements next year

Assets		Liabilities & Equity	
Current assets		Current liabilities	
Cash and equivalents	\$1,629,600	Accounts payable	\$2,880,000
Accounts receivable	5,016,000	Notes payable	<u>1,870,000</u>
Inventories	<u>10,503,600</u>	Total current liabilities	\$4,750,000
Total current assets	\$17,149,200		
		Long-term debt	\$47,500,000
		Stockholders' equity	
Total fixed assets	<u>\$138,580,000</u>	Common stock	8,000,000
		Accumulated retained earnings	<u>64,092,200</u>
		Total equity	\$72,092,200
		Total liabilities and	
Total assets	\$155,729,200	shareholders' equity	\$124,342,200

EFN = \$155,729,200 – 124,342,200 = \$31,387,000