FALL 2011 ENGR 111- MIDTERM ANSWER KEY

Multiple Choice Questions: (Each 2 points)

1. The process of planning and managing a firm's long-term investments is called:
A. working capital management.
B. financial depreciation.
C. agency cost analysis.
D. capital budgeting.
E. capital structure.

2. A business owned by a single individual is called a:
A. corporation.
B. sole proprietorship.
C. general partnership.
D. limited partnership.
E. limited liability company.

3. The three parts of the Du Pont identity can be generally described as:
I. operating efficiency, asset use efficiency and firm profitability.
II. financial leverage, operating efficiency and asset use efficiency.
III. the equity multiplier, the profit margin and the total asset turnover.
IV. the debt-equity ratio, the capital intensity ratio and the profit margin.
A. I and II only
B. II and III only
C. I and IV only
D. I and III only
E. III and IV only

4. Which one of the following statements is correct?
A. Both partnerships and corporations incur double taxation.
B. Both sole proprietorships and partnerships are taxed in a similar fashion.
C. Partnerships are the most complicated type of business to form.
D. Both partnerships and corporations have limited liability for general partners and shareholders.
E. All types of business formations have limited lives.

5. The decisions made by financial managers should all be ones which increase the:
A. size of the firm.
B. growth rate of the firm.
C. marketability of the managers.
D. market value of the existing owners' equity.
E. financial distress of the firm.

6. A stakeholder is:
A. any person or entity that owns shares of stock of a corporation.
B. any person or entity that has voting rights based on stock ownership of a corporation.
C. a person who initially started a firm and currently has management control over the cash flows of the firm due to his/her current ownership of company stock.
D. a creditor to whom the firm currently owes money and who consequently has a claim on the cash flows of the firm.
E. any person or entity other than a stockholder or creditor who potentially has a claim on the cash flows of the firm.

7. In 1990s several Microsoft stakeholders sued the company because:
A. Microsoft's profit margin was too high compared to the other firms in the industry.
B. Microsoft's leverage was too high compared to the other firms in the industry.
C. As the single buyer of a raw material, Microsoft exercised monopsony power.
D. As a monopoly, Microsoft abused its position and reduced the competitiveness in the industry.
E. Microsoft did not pay any dividends to its stockholders.

8. A(n) ____ asset is one which can be quickly converted into cash without significant loss in value.
A. current
B. fixed
C. intangible
D. liquid
E. long-term

9. Your _____ tax rate is the amount of tax payable on the next taxable dollar you earn.
A. deductible
B. residual
C. total
D. average
E. marginal

10. Which one of the following statements concerning liquidity is correct?
A. If you sold an asset today, it was a liquid asset.
B. If you can sell an asset next year at a price equal to its actual value, the asset is highly liquid.
C. Trademarks and patents are highly liquid.
D. The less liquidity a firm has, the lower the probability the firm will encounter financial difficulties.
E. Balance sheet accounts are listed in order of decreasing liquidity.

11. Cash flow to stockholders must be positive when:
A. the dividends paid exceed the net new equity raised.
B. the net sale of common stock exceeds the amount of dividends paid.
C. no income is distributed but new shares of stock are sold.
D. both the cash flow to assets and the cash flow to creditors are negative.
E. both the cash flow to assets and the cash flow to creditors are positive.

12. Which of the following statements concerning the income statement is true?
A. It measures performance over a specific period of time.
B. It determines after-tax income of the firm.
C. It includes deferred taxes.
D. It treats interest as an expense.
E. All of the above.

13. A firm has $300 in inventory, $600 in fixed assets, $200 in accounts receivable, $100 in accounts payable, and $50 in cash. What is the amount of the current assets?
A. $500
B. $550
C. $600
D. $1,150
E. $1,200

Current assets = $300 + $200 + $50 = $550

14. Brad's Company has equipment with a book value of $500 that could be sold today at a 50% discount. Its inventory is valued at $400 and could be sold to a competitor for that amount. The firm has $50 in cash and customers owe it $300. What is the accounting value of its liquid assets?
A. $50
B. $350
C. $700
D. $750
E. $1,000

Liquid assets = $400 + $50 + $300 = $750

15. Art's Boutique has sales of $640,000 and costs of $480,000. Interest expense is $40,000 and depreciation is $60,000. The tax rate is 34%. What is the net income?
A. $20,400
B. $39,600
C. $50,400
D. $79,600
E. $99,600

Taxable income = $640,000 - $480,000 - $40,000 - $60,000 = $60,000; Tax = .34($60,000) = $20,400; Net income = $60,000 - $20,400 = $39,600

16. To calculate sustainable growth rate without using return on equity, the analyst needs the:
A. profit margin.
B. payout ratio.
C. debt-to-equity ratio.
D. total asset turnover.
E. All of the above.

17. If a firm bases its growth projection on the rate of sustainable growth, and shows positive net income, then the:
A. fixed assets will have to increase at the same rate, regardless of the current capacity level.
B. number of common shares outstanding will increase at the same rate of growth.
C. debt-equity ratio will have to increase.
D. debt-equity ratio will remain constant while retained earnings increase.
E. fixed assets, debt-equity ratio, and number of common shares outstanding will all increase.

18. A firm has sales of $1,200, net income of $200, net fixed assets of $500, and current assets of $300. The firm has $100 in inventory. What is the common-size statement value of inventory?
A. 8.3%
B. 12.5%
C. 20.0%
D. 33.3%
E. 50.0%

Common-size inventory = $100 ÷ ($500 + $300) = .125 = 12.5%

19. The interest rate expressed as if it were compounded once per year is called the _____ rate.
A. stated interest
B. compound interest
C. effective annual
D. periodic interest
E. daily interest

20. The highest effective annual rate that can be derived from an annual percentage rate of 9% is computed as:
A. .09e - 1.
B. e^.09 × q.
C. e × (1 + .09).
D. e^.09 - 1.
E. (1 + .09)q.

Short Answer Questions: (each 5 points)

21. Suppose you own 100 shares of IBM stock which you intend to sell today. Since you will sell it in the secondary market, IBM will receive no direct cash flows as a consequence of your sale. Why, then, should IBM's management care about the price you get for your shares?

The current market price of IBM stock reflects, among other things, market opinion about the quality of firm management. If the shareholder's sale price is low, this indirectly reflects on the reputation of the managers, as well as potentially impacting their standing in the employment market. Alternatively, if the sale price is high, this indicates that the market believes current management is increasing firm value and therefore doing a good job.

22. What may be the reasons for a company to buyback its own stocks. Explain two of them.

1.Due to the economic environment the company may not have better alternatives than investing in their own stock.
2. If the management thinks that the stock is undervalued, by buying back its own stock, it sends a signal to the markets that company has more potential than its stock value shows.
3. At the end of the financial period, the management may be trying to meet some ratio targets, like, Earnings per Share, and by buying back its stock the management may try to reach these accounting goals.
4. The management may use this approach as an anti-takeover strategy. To prevent the takeover of the company by another company or a person, management buys back its stock to keep the control of the company.

23. Suppose a firm calculates its external funding needs and finds that it is negative. What are the firm's options in this case?

With a negative external financing need, the firm has a surplus of funds that it can use to reduce current liabilities, reduce long-term debt, buy back common stock, or increase dividends. If acceptable opportunities exist, firms might also use the extra funds to add assets.

24. The Federal Reserve (FED) decides to decrease the Reserve Requirement Ratio (RRR). What would be the effect of this decision on the amount of money supply in the economy? Why does changes in RRR affect money supply?

The money supply would increase.
The ability of banks to give out credit would increase and this would increase the money circulation in the economy.

25. Due to the recent financial crisis, a lot of firms are having a hard time getting loans from the banks. In light of your answer to the previous question, what should the head of the FED do?

Decrease the RRR.

26. Suppose a firm maintains a positive retention ratio and keeps its debt-equity ratio constant every year. When sales grow by 20%, the firm has a negative projected EFN. What does this tell you about the firm's sustainable growth rate? Do you know with certainty, if the internal rate is greater than or less than 20%? Why?

The sustainable growth rate is greater than 20 percent, because at a 20 percent growth rate the negative EFN indicates that there is excess financing still available. If the firm is 100 percent equity financed, then the sustainable and internal growth rates are equal and the internal growth rate would be greater than 20 percent. However, when the firm has some debt, the internal growth rate is always less than the sustainable growth rate, so it is ambiguous whether the internal growth rate would be greater than or less than 20 percent. If the retention ratio is increased, the firm will have more internal funding sources available, and it will have to take on more debt to keep the debt/equity ratio constant, so the EFN will decline. Conversely, if the retention ratio is decreased, the EFN will rise. If the retention rate is zero, both the internal and sustainable growth rates are zero, and the EFN will rise to the change in total assets.

Computational Questions: (each 5 points)

27. You are the Financial Manager of TOMS Inc. You wish to maintain a growth rate of 12% per year and a debt-equity ratio of .30. Profit Margin is 5.9%, and the ratio of total assets to sales is constant at .85. Is this growth rate possible? (Hint: determine what the dividend payout ratio must be.)

$ROE = (PM)(TAT)(EM)$
$ROE = (.059)(1 / 0.85)(1 + 0.3)$

ROE = .0902 or 9.02%

Now, we can use the sustainable growth rate equation to find the retention ratio as:

Sustainable growth rate = (ROE × b) / [1 – (ROE × b)]
Sustainable growth rate = .12 = [.0902b] / [1 – .0902b]
b = 1.19

This implies the payout ratio is:

Payout ratio = 1 – b
Payout ratio = 1 – 1.19
Payout ratio = –0.19

This is a negative dividend payout ratio of negative 19 percent, which is impossible. The growth rate is not consistent with the other constraints. The lowest possible payout rate is 0, which corresponds to retention ratio of 1, or total earnings retention.

The maximum sustainable growth rate for this company is:

Maximum sustainable growth rate = (ROE × b) / [1 – (ROE × b)]
Maximum sustainable growth rate = [.0902(1)] / [1 – .0902(1)]
Maximum sustainable growth rate = .0992 or 9.92%

28. Today, you signed loan papers agreeing to borrow $4,954.85 at 9% compounded monthly. The loan payment is $143.84 a month. How many loan payments must you make before the loan is paid in full?

$$\$4{,}954.85 = \$143.84 \times \left\{ \frac{1 - \left[1/(1 + \frac{.09}{12})^{t} \right]}{\frac{.09}{12}} \right\};\ \mathbf{ln1.3483489 = t \times ln1.0075;\ t = 40}$$

29 .A company has net income of $240,000, a profit margin of 12% and an accounts receivable balance of $400,000. Assuming 80% of sales are on credit, what is the company's days sales in receivables?

This is a multi-step problem involving several ratios. It is often easier to look backward to determine where to start. We need receivables turnover to find days'

sales in receivables. To calculate receivables turnover, we need credit sales, and to find credit sales, we need total sales. Since we are given the profit margin and net income, we can use these to calculate total sales as:

PM = 0.12 = NI / Sales = $240,000 / Sales; Sales = $2,000,000

Credit sales are 80 percent of total sales, so:

Credit sales = $2,00,000(0.80) = $1,600,000
Now we can find receivables turnover by:

Receivables turnover = Credit sales / Accounts receivable = $1,600,000 / $400,000 = 4 times

Days' sales in receivables = 365 days / Receivables turnover = 365 / 4 = 91.25 days

30. An investment project will be carried out if the discounted payback period is less than 2 years. The project has the cash flow stream of $-250, $75, $125, $100, and $50. The cost of capital is 12%. Will it be carried out? Does your decision change if , instead, you use the Net Present Value approach?

Discounted Payback Period Method:

$75/1.12 = $66.96, $125/(1.12)^2 = $99.65, $100/(1.12)^3 = $71.18, $50/(1.12)^4 = $31.78
3 yr. CF: $250 - $66.96 - $99.65 - $71.18 = $12.21 Fraction = $12.21/$31.78 = .38
Discounted Payback: 3 + .38 = 3.38 years

Do not accept the project.

Net Present Value Method:

NPV=-250+66.96+99.65+71.18+31.78=19.57

Accept the project.

31. You want to purchase an annuity. The annuity contract is in the form of 24 equal monthly payments at a 12% stated annual interest rate, compounded monthly. You want the PV of the annuity to be exactly equal to its cost, $3,500. Suppose that your first payment is going to be made immediately. What will your monthly payments be?

The monthly interest rate is the annual interest rate divided by 12, or:

Monthly interest rate = .12 / 12
Monthly interest rate = .01

Now we can set the present value of the monthly payments equal to the cost of the annuity, or $3,500.

$PVA = (1 + r)\ C(\{1 - [1/(1 + r)]^t\} / r)$
$\$3{,}500 = (1 + .01)\ C(\{1 - [1/(1 + .01)]^{24}\} / .01)$
$C = \$163.1258$

32. Annual interest rate is 5%. You are offered an annuity that would pay $1000 every year beginning next year for 10 years. The cost of the annuity today is $4500. Would you buy it?

$PV = 1000(\{1 - [1/(1 + .05)]^{10}\} / .05) = 7721.73$
Buy it.

Bonus Questions: (each 5 points)

33. Prove that the decision to accept or reject a project based on Net Present Value is no different than basing your decision on Net Future Value.

Without loss of generality assume that the initial cost of the project is $C and future cash flows are $F1, $F2, $F3…$FN for N periods.

PV= -C+F1/(1+r)+F2/(1+r)^2+F3/(1+r)^3+….+FN/(1+r)^N

The sign of this expression does not change if we multiply it with (1+r)^N which would give us the Future Value.

Then the decision of accepting or rejecting the project does not change since the sign does not change.

34. VERDE Corp. is a green technology company that grows each year by the Internal Growth Rate. A billionaire thinks that VERDE contributes to the society more than any other charity organization and decides to give VERDE a lump sum cash in the amount of $K. Assuming that everything else stays the same, how would this affect the Internal

Growth Rate of VERDE? Can you work out the formula for Internal Growth Rate incorporating $K?

How are we going to incorporate extra $K into our Balance Sheet and Income Statement?
If we just increase our Equity and to balance it, put the extra money into cash account then the left and the right hand sides of the Balance sheet will increase by the same amount, $K.

$A.g+K=PM.\ S\ .\ b\ .\ (1+g)\ +K$

Since they will cancel each other the Internal Growth Rate (IGR) will not change.
If next year, we decide to invest this money in capital, then the relative change in Net Income and Assets will affect IGR as much as it affects ROA. Note that as ROA increases, IGR increases and vice versa.
If we do not touch the asset side but decrease debt, then the indirect effect of this would be to increase PM due to reduced interest expense. This would again increase the ROA and increase IGR.