Name: _____

**Econ 135: Corporate Finance**
Sample Final Exam – Answer key

For sample questions from chapters 1 to 12, please see:
- Sample midterm 1 and answer key,
- Midterm 1 and answer key,
- Sample midterm 2 and answer key,
- Midterm 2 and answer key.

**Multiple Choice Questions** (10 points)
Circle the right answer. Each question is worth 2 points.

1) A cash payment made by a firm to its owners as a result of a one-time event is called a:
   a) Share repurchase.
   b) Liquidating dividend.
   c) Regular cash dividend.
   **d) Special dividend.**
   e) One-time dividend.

2) Which of the following is true regarding share repurchases?
   a) In practice, there are essentially no differences between a share repurchase and a cash dividend.
   b) Share repurchases can be undertaken with the sole purpose of reducing the firm's taxes.
   **c) Repurchasing shares can stabilize the firm's payment of cash dividends.**
   d) Share repurchases result in a decrease in earnings per share.
   e) Investors will not prefer share repurchases to extra cash dividends if the capital gains tax rate is lower than the tax rate on dividends.

3) The length of time between the payment for inventory and the collection of cash from receivables is called the _____.
   a) operating cycle
   b) inventory period
   c) accounts receivable period
   d) accounts payable period
   **e) cash cycle**

4) Which of the following parties will likely benefit the most from the underpricing of a new, IPO common stock issue handled on a firm-commitment basis?
   a) Existing bondholders
   b) The underwriter
   c) New shareholders who purchase stock in the aftermarket
   d) The issuing firm
   **e) New shareholders who purchase stock from the underwriting syndicate**

5) A firm which successfully employs a _____ short-term financial policy will probably increase its risk of default and/or inventory stockouts.
   a) flexible
   b) **restrictive**
   c) neutral
   d) just-in-time
   e) zero net working capital

**Numerical problems** (32 points)

Please **show all calculations**. If you're stuck, **assume a solution** to get full credit on a later part.

1) *(3 pts.)* Your company purchased $50,000 worth of inventory on January 2nd on credit. The terms of sale are 2/15, net 30. What is the effective annual interest rate if you pay the full amount in 90 days without any penalty or late fee from your supplier?
   Implicit interest charged for borrowing 98% of $50,000 for 75 days = 2% of $50,000
   Implicit interest rate = .02/.98
   $(1 + .02 / .98)^{365/75} - 1 = 10.33\%$

2) *(10 pts.)* A firm reported sales of $20,000 in November, $30,000 in December, and projects sales of $40,000 for January, $50,000 for February, and $35,000 for March. The firm's cost of goods sold every month is equal to 75% of the next month's sales. The firm collects its receivables in 60 days and pays its payables in 30 days. The firm begins January 1 with $50,000 in cash. All sales and purchases are on credit.
   a) *(2 pts.)* What is the accounts receivable balance at the end of January?
      Dec. sales + Jan. sales = 30,000 + 40,000 = 70,000
   b) *(2 pts.)* What is the accounts payable balance at the end of January?
      75% of Feb. sales = 50,000 x .75 = 37,500
   c) *(2 pts.)* What are the total cash collections for February?
      Collections in Feb. are Dec. sales = 30,000
   d) *(2 pts.)* What is the cash balance at the end of January?
      Beg cash = $50,000
      Collections = $20,000 (Nov. sales)
      Jan. disbursements = Dec. purchases = 75% of Jan. sales = .75 * $40,000 = $30,000
      Ending cash = 50,000 + 20,000 - 30,000 = 40,000
   e) *(2 pts.)* What is the cash balance at the end of February?
      Beg cash = $40,000; Collections = $30,000 (Dec. sales); Payments = $37,500 (Jan. purchases);
      Ending cash = 40,000 + 30,000 - 37,500 = 32,500

3) *(3 pts.)* A firm has a target debt/equity ratio of 1/3. After-tax earnings for 2012 were $2,000,000 and the firm needs $1,000,000 for new investments. If the company follows a residual dividend policy, what dividend will be paid?
   25% financed with debt (250,000), 75% financed with equity (750,000)
   Dividends = net income – equity financing = $2 million – 750,000 = $1.25 million

4) *(10 pts.)* A firm has after-tax earnings of $1.6 million from last year in its cash account, and the firm needs $2.2 million for new investments. The firm currently has one million shares outstanding, trading at $8 each. The market value of debt is $12 million.

   a) *(2 pts.)* If the company follows a residual dividend policy and wants to maintain the current debt/equity ratio, what dividend per share will be paid?
      MV of firm = MV of equity + MV of debt = $8m + $12m = $20m
      % financed with debt = 12/20 = 60%
      % financed with equity = 8/20 = 40%
      Equity needed for projects = 2.2m x .40 = 880,000
      Dividends = 1,600,000 - 880,000 = 720,000

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Dividend per share = 720,000/1,000,000 = $0.72

*b)* *(2 points)* If the spread charged by the underwriter is 2% and legal and accounting costs are $15,000, what are the total flotation costs?
Amount to be borrowed = 60% * $2.2 million = $1.32 million
Amount received = $1.32 million = (1 – spread) new debt issued
New debt issued = $1.32 million / (1 – 2%) = $1.35 million
Spread = 2% * $1.35 million = $26,900
Flotation costs = $26,900 + $15,000 = $41,900

c) *(2 pts.)* What will be the new share price if the share has just gone ex-dividend, ignoring taxes?
$8-0.72=$7.28

d) *(2 pts.)* How many shares would still be outstanding if the company used all $1.6 million to repurchase shares instead?
Firm repurchases $1.6 million / $8 = 200,000 shares
New number of shares outstanding: 1m - 200k = 800,000

e) *(2 pts.)* What would be the new share price after the repurchase (calculate!)?
Old MV of firm = MV of equity + MV of debt = $8m + $12m = $20m
New MV of firm = $20m – $1.6m = $18.4m
New MV of equity = $18.4m – $12m= $6.4 m
New share price = $6.4m/800,000 = $8

5) *(6 pts.)* Your firm is financed 100% with equity and has a tax rate of 35%. There are 50,000 shares of stock outstanding with a market price of $8 per share. The firm wants to issue bonds to repurchase $200,000 worth of shares. Assume that investors are not concerned about bankruptcy.

a) *(2 points)* What will be the new value of the firm as soon as the plan is announced?
$V_U$ = 50,000 * $8 = $400,000
$V_L = V_U + DT_C$ = $400,000 + 35% * $200,000 = 470,000

b) *(2 points)* What will be the new share price?
New share price P = $470,000 / 50,000 = $9.40

c) *(2 points)* How many shares will be outstanding after the transaction?
# repurchased = amount spent on repurchasing / new share price = $200,000 / $9.40 = 21,277
# of shares outstanding = old number - # repurchased = 50,000 - 21,277 = 28,723

## Equation sheet

**Cash flow calculations**

OCF = EBIT + depreciation – taxes
OCF = (sales-costs)(1-T) + depreciation*T (without interest)
Net capital spending = Ending NFA – beginning NFA + depreciation
Change in NWC = Ending NWC – beginning NWC
CFFA = OCF – net capital spending – change in NWC
CF to creditors = interest paid – net new borrowing
CF to stockholders = dividends paid – net new equity raised

**Some financial ratios**

Current ratio = current assets / current liabilities
Quick ratio = (current assets – inventory)/current liabilities
Cash ratio = cash / current liabilities
Total debt ratio = (total assets – total equity) / total assets
Debt-equity ratio = total debt / total equity
Times interest earned ratio = EBIT/interest
Cash coverage ratio = (EBIT + depreciation) / interest
Inventory turnover = COGS / average inventory
Inventory period = 365 days / inventory turnover
A/R turnover = credit sales / average accounts receivable
A/R period = 365 days / accounts receivable turnover
A/P turnover = COGS / average accounts payable
A/P period = 365 days / accounts payable turnover
Operating cycle= inventory period + A/R period
Cash cycle = operating cycle – A/P period

**Other equations**

$$\text{Internal growth rate} = \frac{ROA * b}{1 - ROA * b}$$

$$\text{Sustainable growth rate} = \frac{ROE * b}{1 - ROE * b}$$

$$\text{Annuity PV} = \frac{C}{r}\left(1 - \frac{1}{(1+r)^t}\right)$$

$$\text{Perpetuity PV} = \frac{C}{r}$$

After-tax salvage = salvage – $T_C$*(salvage – book value)
Fisher effect: 1+r=(1+R)(1+h)

**Stock valuation**

$P_0=(D_1+P_1)/(1+k)$
Constant dividends: $P_0=D/k$

Dividend growth model: $P_t = \frac{D_t(1+g)}{k-g} = \frac{D_{t+1}}{k-g}$

**Calculating returns and variability**

Percentage return on stock: $R = D_{t+1}/P_t + (P_{t+1} - P_t)/P_t$

Historical

$$\bar{R} = \frac{1}{n}\sum_{i=1}^{n} R_i$$

$$\sigma^2 = \frac{1}{n-1}\sum_{i=1}^{n}(R_i - \bar{R})^2$$

$$\sigma = \sqrt{\sigma^2}$$

Expected

$$E(R) = \sum_{i=1}^{n} p_i R_i$$

$$\sigma^2 = \sum_{i=1}^{n} p_i (R_i - E(R))^2$$

$$\sigma = \sqrt{\sigma^2}$$

**Portfolios**

$$E(R_{Pi}) = \sum_{j=1}^{m} w_j E(R_{ij})$$

$$E(R_P) = \sum_{i=1}^{n} p_i E(R_{Pi})$$

$$\sigma^2 = \sum_{i=1}^{n} p_i (E(R_{Pi}) - E(R_P))^2$$

$$\beta_P = \sum_{j=1}^{m} w_j \beta_j$$

**Capital market theory and the cost of capital**

$$SML : E(R_M) - R_f = \frac{E(R_i) - R_f}{\beta_i}$$

$$CAPM : E(R_i) = R_f + \beta_i (E(R_M) - R_f)$$

$$WACC = \frac{E}{V} R_E + \frac{P}{V} R_P + \frac{D}{V} R_D (1 - T_C)$$

**Value of financial leverage**

PV of interest tax shield = $T_c D$

$$V_U = \frac{CFFA}{R}$$ if CFFA is constant forever

$$V_L = V_U + T_C D$$