

**Sample Final Exam**  
**Fall Semester, 2014-2015**

**Course: Corporate Finance (Course Number: 02833430)**

**Instructor: Jiangmin Xu**

**Exam Date: January 13, 8:30am to 10:30am      Length: 2 Hours**

**Student:**

**Class:**

**Name:**

**Student ID:**

**Format: Closed book. Please write all your answers on the exam paper.**

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**INSTRUCTIONS**

You have 2 hours to complete this exam. This exam is strictly closed book and closed notes, except for one sheet of A4-sized paper with your notes/formulas written on both sides.

You are NOT allowed to use any electronic devices such as cell phones, PDAs, laptops, MP3 players, iPods, iPads etc. during the exam. Calculators are allowed, but you must NOT use any calculator-related apps on your electronic devices.

There are **20 questions** for a total of **200 points**. The difficulty of each question varies. Use your time wisely.

**IMPORTANT: YOU NEED TO CLEARLY MARK THE CORRECT ANSWER AND SHOW YOUR WORK & CALCULATION TO GET FULL CREDIT!!!**

To ensure fairness, you are requested to stop writing promptly at the end of the exam.

**Please do not turn over this cover page, until requested.**



1. You are considering the following project. The project costs \$500 in year 0 and generates a (free) cash flow of \$800 in year 3 only. The discount rate to use is 6%. What is the NPV of the project? (Choose the answer below that is closest to the value you computed.)

(A) 170

(B) 180

(C) 190

(D) 200

(E) 210

2. Assume that the CAPM holds. What is the beta of a firm with cost of equity of 8%, if the risk-free rate is 2% and the market's expected return is 6%?

- (A) 0.75
- (B) 1.0
- (C) 1.25
- (D) 1.5
- (E) 2.0

3. Downward Corporation is expected to pay a dividend in year 1 of \$1.5 and the dividends are expected to **decline** at a rate of 2% per year afterwards. An appropriate required rate of return for the stock is 8%. What should be the stock price of the company at year 0 based on the dividend discount model?

- (A) \$9
- (B) \$13
- (C) \$15
- (D) \$18
- (E) \$21

4. You are considering acquiring a common stock that you would like to hold for one year. You expect to receive both \$1.41 in dividends and \$33 from the sale of the stock at the end of one year. What is the price you would pay for the stock today, if you want to earn an 11% return?

(A) 23

(B) 26

(C) 29

(D) 31

(E) 35

5. You are running a pension fund for two years. YTM is 10%. As a liability, you have to pay \$500 in year one and \$500 again in year two. Calculate the modified duration for the liability (treat this in a similar way as if it was a “bond”). (Choose the answer below that is closest to the value you computed.)

- (A) 1.2
- (B) 1.35
- (C) 1.5
- (D) 1.75
- (E) 2

6. The price of a one-year zero-coupon bond with face value of \$100 is \$80, and the price of a two-year zero-coupon bond with face value of \$100 is \$60. What is the price of a \$1000 face value, 2-year coupon bond with 20% coupon rate paid annually?

- (A) 680
- (B) 780
- (C) 880
- (D) 980
- (E) 1080

7. You would like to get the equity beta of Alibaba's stock, but given its short trading history, you decided to use the beta of a comparable company Amazon.com instead. Amazon.com has an equity beta of 2, and a debt-to-equity ratio of 1/2. Alibaba has the target debt-to-equity ratio of 0.25. The tax rate is 33.33%. Using the unlevering and relevering beta method, estimate the equity beta of Alibaba? (Choose the answer below that is closest to the value you computed.)

(A) 0.5

(B) 0.75

(C) 1.25

(D) 1.5

(E) 1.75

8. Suppose company QQQ has an equity cost of capital of 10%, market capitalization of \$10.8 billion, and an enterprise value of \$14.4 billion. Assume that QQQ's debt cost of capital is 6% and the tax rate is 40%. QQQ has a cash value of 0. What is QQQ's after-tax WACC? (Choose the answer below that is closest to the value you computed.)

- (A) 6.8%
- (B) 7.2%
- (C) 7.6%
- (D) 8.0%
- (E) 8.4%

9. *JX Industries* has 10 million shares outstanding and a current share price of \$40 per share. It also has debt outstanding. This debt is in the form of a risk-free coupon bond, is two years away from maturity, has annual coupons with a coupon rate of 10%, and has a \$100 million face value. The first coupon payment will be paid in exactly one year. The YTM of the bond is 2%, which is the same as the risk-free interest rate. The equity beta of *JX Industries* is 2 and the expected market return is 6%. The tax rate is 35%. Based on this information, what is the after-tax WACC of *JX Industries*? (Choose the answer below that is closest to the value you computed.)

- (A) 6%
- (B) 6.5%
- (C) 7%
- (D) 7.5%
- (E) 8%

(Question 10 and 11 use the same information)

10. You are hired by *Apple* to evaluate a new product line for the company. The upfront investment cost required to launch the product line is \$10 million. The product will generate a free cash flow of \$500,000 in the first year, and this free cash flow is expected to grow at a rate of 5% per year. *Apple* has an equity cost of capital of 12%, a debt cost of capital of 3%, and a tax rate of 40%. *Apple* maintains a debt-equity ratio of 0.40. (There is no cash.) **Using the WACC method**, what is the NPV of the new product line? (Choose the answer below that is closest to the value you computed. You will NOT get any credit if you do not use the WACC method.)

- (A) \$1.25 million
- (B) \$2.25 million
- (C) \$3.25 million
- (D) \$4.25 million
- (E) \$5.25 million

11. How much of the new product line's enterprise value is due to the present value of interest tax shields? (Choose the answer below that is closest to the value you computed.)

(A) 4.7%

(B) 5.7%

(C) 6.7%

(D) 7.7%

(E) 8.7%

12. Macrosoft will have EBIT this coming year (year 1) of \$15 million. The total capital expenditures and increases in net working capital together will be \$5 million in year 1, and the depreciation expenses will be \$2 million. Macrosoft is currently an all-equity firm with a corporate tax rate of 40% and a cost of capital of 10%. The firm does not have any cash. If Macrosoft's free cash flows are expected to grow by 8% per year after year 1, what is the (intrinsic) value of its equity today? (Choose the answer below that is closest to the value you computed.)

- (A) 100
- (B) 200
- (C) 300
- (D) 400
- (E) 500

13. You have an arrangement with your broker to request 1000 shares of all available IPOs. Suppose that 80% of the time, the IPO is "successful" and the stock price rises by 15% on the first trading day (after the IPO), and 20% of the time the IPO "fails" and the stock price falls by 10% on the first day. Suppose you expect to receive 200 shares when the IPO is successful, and 1000 shares when it fails. Assume the IPO price is \$30 per share. What is your expected one-day (first-day) return on your IPO investments? (Choose the answer below that is closest to the value you computed.)

(A) -0.5%

(B) 0.2%

(C) 0.6%

(D) 1%

(E) 2%

14. HHH is an all-equity firm whose cost of equity is 8%. HHH does a leveraged recapitalization, issuing debt and repurchasing stock, until its debt-equity ratio is 0.70. Due to the increased risk, shareholders now expect a return of 12% on HHH's equity. Assuming perfect capital markets, there are no taxes and HHH's debt is risk-free, what is the cost of debt for HHH? (Choose the answer below that is closest to the value you computed.)

- (A) 1%
- (B) 1.3%
- (C) 1.6%
- (D) 1.9%
- (E) 2.2%

15. Below you will find the income statement and the balance sheet for *Example.com* for the years 2008 and 2009. Please notice that Cash on the balance sheet is **not** a part of the working capital. Year 0 (right now) is 2009.

All numbers are in thousands:	<b>INCOME STATEMENT</b>		All numbers are in thousands:	<b>BALANCE SHEET</b>	
	<b>2008</b>	<b>2009</b>		<b>2008</b>	<b>2009</b>
Sales	800	1250	<i>Assets</i>		
Costs	250	350	Cash	100	150
Depreciation	50	100	Accounts Receivable	250	400
EBIT	500	800	Inventory	100	200
Interest	100	100	<i>Total Current Assets</i>	<i>450</i>	<i>750</i>
EBT	400	700	Property and Equipment	2000	2050
Tax	160	280	Goodwill	150	140
Net Income	240	420	<i>Total Assets</i>	<i>2600</i>	<i>2940</i>
			<i>Liabilities</i>		
			Accounts Payable	200	250
			Short-Term Debt	100	50
			<i>Total Current Liabilities</i>	<i>300</i>	<i>300</i>
			Long-Term Debt	1000	1000
			<i>Total Liabilities</i>	<i>1300</i>	<i>1300</i>
			<i>Equity (market cap)</i>	<i>1300</i>	<i>1640</i>

The capital expenditures in 2009 were 200 thousand. Assume that total unlevered free cash flows will grow at the rate of 30% each year until 2012, and then the growth rate will drop to 3% each year forever (i.e. terminal growth rate). You also have the following information:

- The company has 1 million shares outstanding in December, 2009
- The corporate tax rate is 40%
- The equity beta of *Example.com* is 0.94. The target debt-to-value ratio of *Example.com* is  $D/(D+E) = 0.3$
- The risk-free rate is 4%, and the market risk premium is 6%
- You estimated the cost of debt for *Example.com* to be 5%

What is the intrinsic stock price of *Example.com* at 2009 (year 0)? (Choose the answer below that is closest to the value you computed.)

- (A) \$5
- (B) \$6
- (C) \$7
- (D) \$8
- (E) \$9

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16. One share of Bank of America (BAC) costs \$10 right now. A European put with a strike price of \$9 and a time to expiry of two years is trading at \$2. The annual risk-free interest rate is 8%. If you expect BAC to pay out a dividend of \$1 in year 1, how much should you be willing to pay for a European call option with a strike price of \$9 which expires in two years? (Choose the answer below that is closest to the value you computed.)

(A) 2.75

(B) 3.35

(C) 3.75

(D) 4.35

(E) 4.75

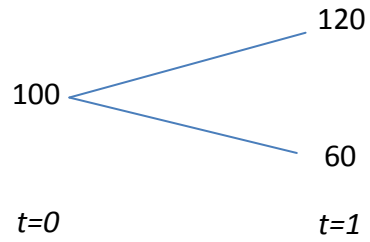
17. Company AQR's stock is trading at \$50 per share. After one year, the price will be either \$70 a share, or \$40 a share. There is no dividend. Consider a European Put option on AQR with the strike price of \$80 and expiration in one year. Construct a portfolio of stock and TBills that replicates the payoffs of the put. Assume that the risk-free rate is 0% (zero). What is the number of shares invested in the stock, the amount invested in the TBills, and the price of the put option? (Choose the answer below that is closest to the value you computed.)

- (A) -0.6 (shares of stock), 40 (amount in the TBills), 10 (price of the put)
- (B) -0.7 (shares of stock), 50 (amount in the TBills), 15 (price of the put)
- (C) -0.8 (shares of stock), 60 (amount in the TBills), 20 (price of the put)
- (D) -0.9 (shares of stock), 70 (amount in the TBills), 25 (price of the put)
- (E) -1 (shares of stock), 80 (amount in the TBills), 30 (price of the put)

18. Consider an American Call on *Drugs Inc.* with the strike price of \$40 in the following two-period binomial model (the call expires in period 2). The current stock price of *Drugs Inc.* (at period 0, today) is \$30 per share. In period 1, the price could become either \$60 or \$20. If the stock price is \$60, then in period 2 it can change to \$120 or \$50. If the stock price is \$20, then in period 2 it drops to \$10 or rises to \$40. *Drugs Inc.* does not pay dividends, and the risk-free rate over any one period is 5%. What is the price of the call right now at period 0? (Choose the answer below that is closest to the value you computed.)

- (A) 5.5
- (B) 6
- (C) 6.5
- (D) 7
- (E) 7.5

19. Consider the following binomial tree for a stock (price). Assume the risk-free rate  $r=0.1$ . There is no dividend.



What is the price of an **American put** option with strike price  $K=108$  at  $t=0$ ? (Choose the answer below that is closest to the value you computed.)

- (A) \$4.3
- (B) \$6.4
- (C) \$7.2
- (D) \$8.1
- (E) \$9.0

20. You are the CEO of a **leveraged** buyout firm and are evaluating a potential buyout of BAD Company. BAD's stock price is \$20, and it has 2 million shares outstanding. The company currently has no debt, nor does it have any cash. You believe that if you buy the company and replace its management, its total (enterprise) value will increase by 40%. You are planning on doing a **leveraged** buyout of BAD (i.e. through borrowing money/using debt), and will offer \$25 per share for control of the company. Assuming you succeed and get 50% control (i.e. you bought 50% of all the shares outstanding at a price of \$25 per share by borrowing the necessary amount of money), what is the equity value of the company BAD after the leveraged buyout? [After the leveraged buyout, you took the debt (i.e. the money you borrowed for the buyout) onto the company BAD's balance sheet.]

- (A) 20
- (B) 25
- (C) 28
- (D) 31
- (E) 56