

**Guanghua School of Management Final Exam
Fall Semester, 2022-2023**

Course: Corporate Finance (Course Number: E2833431)

Instructor: Jiangmin Xu

Exam Date: December 27, 14:00pm to 16:00pm Length: 2 hours

Student Name:

Student ID:

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

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 **12 questions** in total. Use your time wisely.

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. (10%)

Today is year 0. Consider a project with free cash flows in one year (next year) of \$90,000 in a weak economy or \$117,000 in a strong economy, with each outcome being equally likely (i.e., probability = 0.5). The initial investment required for the project is \$80,000, and the project's cost of capital is 15%. The risk-free interest rate is 5%. Suppose that to raise the funds for the initial investment, the firm borrows \$40,000 at the risk-free interest rate and issues new equity to cover the remainder of the funds. In this situation, what is the equity cost of capital for the firm's levered equity? (Round your answer to 2 decimal places)

2. (5%)

Luther is a successful logistical services firm that currently has \$5 billion in cash. Luther has decided to use this cash to repurchase shares from its investors, and has already announced the stock repurchase plan. Currently Luther is an all-equity firm with 1.25 billion shares outstanding. Luther's shares are currently trading at \$20 per share. With perfect capital markets, what is the market price per share of Luther's stock after the share repurchase?

3. (10%)

Trouble Maker is a firm that is in high leverage. Today (now) is year 0. Suppose equity holders of Trouble Maker now have an opportunity to invest \$7 billion to try to save the firm. This investment has similar risk to the rest of the firm. Trouble Maker has an equity-to-debt ratio of 1/2. The firm has an after-tax WACC of 10%, the risk-free rate is 2%, and the market risk premium 5%. Assume CAPM holds. The firm's cost of debt is 6%, and it pays a corporate tax rate of 35%. Assume that the beta of the debt, β_D , is equal to 0.45. What would the minimum possible net present value for the investment have to be, so that the equity holders of Trouble Maker are willing to make the investment without triggering the debt overhang problem? (Round your answer to 2 decimal places in billions)

4. (10%)

Today is year 0. Next year (year 1), Monsters Incorporated (MI) will have a total asset value of either \$100 million, \$150 million, or \$191 million, with each outcome being equally likely (i.e., probability of each = $1/3$). MI has no cash. The cost of capital for MI is 5%. Suppose that MI has zero-coupon debt with a \$125 million face value due next year (in year 1). What is the initial value of MI's equity in year 0 (assume that there is no additional cost in the event of default)? (Round your answer to 2 decimal places in millions)

5. (5%)

Consider the following example of an equity carveout. The parent firm is called BIG, and it has a subsidiary company called TINY. BIG wants to unleash the true value of TINY. To do so, BIG sold a small portion of the value of TINY in an IPO, and in about six months, it plans to distribute the remaining shares of TINY to BIG shareholders in a spinoff. When the spinoff happens, BIG shareholders will receive 2.5 shares of TINY for every share of BIG that they own.

On the day before the IPO of TINY, BIG was trading at \$117.6 per share. After the first day of trading of the IPO, TINY closed at \$63.3 per share, and BIG closed at \$98.8. What is the “stub value” per share of the firm BIG?

6. (10%)

You own your own firm and you need to raise \$50 million to fund an expansion. Following the expansion, your firm will be worth \$75 million in its unlevered form. You want to go ahead with the expansion, but you are concerned that you may not be able to maintain ownership of over 50% of your firm's equity. So you decide to issue some permanent debt to finance part of the expansion. Assume that the debt is fairly priced, capital markets are perfect except for the existence of corporate taxes, and that your firm has a 40% tax rate. If you want to maintain an equity ownership of at least 50%, what is the minimum amount of permanent debt that you must issue to fund the expansion? (Round your answer to 3 decimal places in millions)

7. (5%)

Suppose that all capital gains are taxed at a 20% rate, and that the dividend tax rate is 40%. Rearden Metal is currently trading for \$40 per share, and is about to pay a \$5 special dividend. Absent any other market frictions or news, what will be Rearden's share price just after the dividend is paid?

8. (10%)

JC Industries' Market Value Balance Sheet (\$ Millions) and Cost of Capital

Assets		Liabilities		Cost of Capital	
Cash	0	Debt	200	Debt	6%
Other Assets	500	Equity	300	Equity	12%
				Tax rate	35%

JC Industries New Project Free Cash Flows (\$ Millions)

Year	0	1	2	3
Free Cash Flows	-\$100	\$40	\$50	\$60

The new project runs until year 3 and there are no cash flows after year 3. Assume that this new project has the same risk as rest of the firm for JC Industries, and that the firm wants to keep its debt to equity ratio constant. Today is year 0. What is the debt capacity for JC Industries' new project in year 1? (Round your answer to 2 decimal places in millions)

9. (5%)

You founded your own firm three years ago. You initially contributed \$200,000 of your own money and in return you received 2 million shares of stock. Since then, you have sold an additional 1 million shares of stock to angel investors. You are now considering raising capital from a venture capital firm. This venture capital firm would invest \$5 million and would receive 2 million newly issued shares in return. Assuming that this is the venture capitalist's first investment in your firm, what is the post-money valuation of your firm?

10. (10%)

The current stock price of Kinston Corporation is \$10. The stock does not pay any dividend. The risk-free rate is 3% over any one period. Today is period 0 ($t = 0$). In each of the next two periods, the stock price can either go up by \$3, or go down by \$2. There is a **European call** option written on the stock with strike price $K = \$9$ which expires at period 2 ($t = 2$). Using the binomial option pricing model, what is the price of this European call option at $t = 0$? (Round your answer to 1 decimal place)

11. (10%)

Taggart Transcontinental's stock has a volatility of 25% per year and a current stock price of \$40 per share. Taggart pays no dividends. The risk-free interest rate is 4% per year. Consider a one-year **European put** option on Taggart stock with a strike price of \$50. What is the put option price, according to the Black-Scholes-Merton option pricing formula (please use continuous discounting Ke^{-rT} to calculate the present value of K)? (Round your answer to 1 decimal place)

Use the standard normal CDF tables given below for selected values:

x	N(x)
0.4076	0.6582
0.4576	0.6764
0.5076	0.6941
0.5576	0.7114
0.6076	0.7283
0.6576	0.7446
0.7076	0.7604
0.7576	0.7757
0.8076	0.7903
0.8576	0.8044
0.9076	0.8180

12. (10%)

Please judge whether the following statements are correct or wrong. (For correct ones, write T. For wrong ones, write F. No explanations are required.)

- (1) According to the Jensen and Meckling model of agency problems, CEOs should be compensated with a high level of salary.
- (2) Proxy fights by corporate activists and product market competition can both be useful corporate governance mechanisms for disciplining the management.
- (3) According to the law and finance literature (La Porta et al., 1998; 1999), the reason of a very high ownership concentration is different from Jensen and Meckling's idea regarding manager incentives.
- (4) In some countries/regions, it can be difficult to establish diffused ownership as a direct result of strong investor protection.
- (5) One of the reasons for IPO underpricing is the free-rider problem: there are many small shareholders and they are not willing to pay a very high price for IPO shares.