

第一部分：公司理財（共五十分）

(一) 單選題（共三十分；每題三分）※ 注意：請於試卷內之「非選擇題作答區」標明題號依序作答。

1. Which of the following statements is correct?
 - a) An important property of the Law of One Price is that it holds in a market where arbitrage is possible.
 - b) The net present value (NPV) of trading a security in a normal market is positive.
 - c) When a bond is overpriced, the arbitrage strategy involves selling the bond and investing some of the proceeds.
 - d) We cannot separate a firm's investment decision from the decision of how to finance the investment.
 - e) In financial markets, it is not possible to sell a security we do not own.

2. Which of the following statements is false?
 - a) The internal rate of return (IRR) investment rule states that you should turn down any investment opportunity where the IRR is less than the opportunity cost of capital.
 - b) There are situations in which multiple IRRs exist.
 - c) The IRR is not affected by the scale of the investment opportunity.
 - d) When the risks of two projects are different, only the IRR rule will give a reliable answer.
 - e) Problems can arise using the IRR method when the mutually exclusive investments have different cash flow patterns.

Consider the following list of projects for the next two questions.

Project	Investment	NPV
A	135,000	6,000
B	200,000	30,000
C	125,000	20,000
D	150,000	2,000
E	175,000	10,000
F	75,000	10,000
G	80,000	9,000
H	200,000	20,000
I	50,000	4,000

3. Assuming that your capital is constrained, which project should you invest in first?
 - a) I
 - b) C
 - c) B
 - d) F
 - e) H

4. Assuming that your capital is constrained, so that you only have \$600,000 available to invest in projects, which project should you invest in and in what order?
 - a) CBFH
 - b) BCFG
 - c) CBFG
 - d) BCHF
 - e) FGCB

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5. Which of the following statements is false?
- The total market value of the firm's securities is equal to the market value of its assets, whether the firm is unlevered or levered.
 - While debt itself may be cheap, it increases the risk and therefore the cost of capital of the firm's equity.
 - Although debt has a lower cost of capital than equity, leverage does not lower a firm's weighted average cost of capital (WACC) in a perfect market.
 - If a firm is unlevered, all of the free cash flows generated by its assets are available to be paid out to its equity holders.
 - By holding a portfolio of the firm's equity and its debt, we can replicate the cash flows from holding its levered equity.
6. Suppose that ABC Corp. currently has no debt and has an equity cost of capital of 10%. ABC Corp. is considering borrowing funds at a cost of 6% and using these funds to repurchase existing shares of stock. Assume perfect capital markets. If ABC Corp. borrows until it achieves a debt-to-value ratio of 20%, then what is its levered cost of equity?
- 11.0%
 - 9.2%
 - 10.0%
 - 9.0%
 - 10.8%
7. XYZ Ltd.'s marginal tax rate is 35%, and its borrowing cost is 7%. Assume that investors in XYZ Ltd. pay a 15% tax rate on income from equity and a 35% tax rate on interest income. If XYZ Ltd. were to issue sufficient debt to reduce its corporate taxes by \$1 billion per year permanently, then what is the value of the tax shield?
- \$19.05 billion
 - \$14.29 billion
 - \$8.16 billion
 - \$6.12 billion
 - \$33.33 billion
8. Suppose that all capital gains are taxed at a 20% rate, and that the dividend tax rate is 40%. NTU Plc. is currently trading for \$40 per share and is about to pay a \$5 special dividend. Now that NTU Plc. made a surprise announcement that it would do a share repurchase rather than pay a special dividend, what is the net tax savings per share for an investor that would result from this decision?
- \$3.75
 - \$1.00
 - \$0.00
 - \$4.00
 - \$1.25
9. Which of the following statements is correct?
- Merger activity is greater during economic contractions than during expansions.
 - When a bid is announced, the target shareholders suffer a significant loss on average in their stock price.
 - All else being equal, larger firms, because they are more diversified, have a lower probability of bankruptcy.
 - Vertically integrated companies may be large, but unlike other large corporations, since they remain focused in one industry they are easy to run.
 - Because it may be easier to measure performance accurately in a conglomerate, agency costs may be reduced and resources may be more efficiently allocated.

10. Which of the following statements is false?
- If the value of the firm's assets exceeds the required debt payment, debt holders are fully repaid.
 - Corporate debt can be viewed as a portfolio of riskless debt and a short position in a call option on the firm's assets with a strike price equal to the required debt payment.
 - Viewing debt as an option portfolio is useful as it provides insight into how credit spreads for risky debt are determined.
 - In the context of corporate finance, equity is at-the-money when a firm is close to bankruptcy.
 - A share of stock can be thought of as a call option on the assets of the firm with a strike price equal to the value of debt outstanding.

(二) 簡答題 (配分詳見各題)

- Financial economists document several empirical puzzles regarding the initial public offering (IPO). Briefly discuss two of them. (十分；答案限定在五行之內，否則不予計分)
- Briefly discuss the "free cash flow hypothesis". (五分；答案限定在五行之內，否則不予計分)
- Briefly discuss the practice of "backdating" in the executive compensation. (五分；答案限定在五行之內，否則不予計分)

第二部分：投資學 (共五十分) ※ 注意：請於試卷內之「非選擇題作答區」標明題號依序作答。

Multiple-Choice Question (3 points for each question)

- Assume that the stock of Chiron, a drug company, currently sells for \$110. A European call on Chiron has a strike price of \$121, expires two years from now, and currently sells for \$20. What is the value of the comparable European put? Assume the risk-free rate is 10 percent per year and that Chiron is certain pay a dividend of \$3.3 one year from now.
(A) \$3 (B) \$5.7 (C) \$15.7 (D) \$13 (E) \$23
- The following equations describe the annual returns for stocks A and B , where \tilde{f} is the change in the GDP growth rate and A and B represent stocks A and B , respectively

$$\tilde{r}_A = 0.12 + 3\tilde{f} + \tilde{\varepsilon}_A$$

$$\tilde{r}_B = 0.16 + 4\tilde{f} + \tilde{\varepsilon}_B$$
 The $\tilde{\varepsilon}$'s are assumed to be uncorrelated with each other as well as with the GDP factor, and factor variance is assumed to be 0.01. Compute the covariance between the two stock returns.
(A) 0.07 (B) 0.09 (C) 0.12 (D) 0.16 (E) 0.24
- Over extremely short time intervals, the return of Apple is perfectly negatively correlated with the return of a put option on the company. The standard deviation of the return on Apple stock 20 percent per year, while the standard deviation of the return on the option is 60 percent per year. What portfolio weights (x_A, x_p) on Apple stock and its put option create a riskless investment over short time intervals? x_A represents the weight on Apple stock and x_p represents the weight on its put option.
(A) (0.25, 0.75) (B) (0.75, 0.25) (C) (-0.25, 1.25) (D) (1.25, -0.25)
(E) (0.5, 0.5)
- You consider buying a share of stock at a price of \$20. The stock is expected to pay a dividend of \$1.5 next year and your advisory service tells you that you can expect to sell the stock in one year for \$23. The stock's beta is 1.5, the risk-free rate is 6% and the expected return on market portfolio is 18%. What is the stock's abnormal return?
(A) -1.5% (B) -3.5% (C) 2.5% (D) 4.5% (E) 6.5%

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5. You own a \$12 million bond portfolio with a modified duration of 11 years and you want to limit your risk but institutional constraints prohibit trading the bond portfolio. T-bond futures are available with a modified duration of the deliverable instrument of 8 years. The futures are priced at \$110,000. The proper hedge ratio to use is _____.
- (A) 79 (B) 89 (C) 109 (D) 130 (E) 150
6. Which of the following would violate the efficient market hypothesis?
- (A) The correlation between the market return one week and the return the following week is zero.
- (B) High earnings growth stocks fail to generate higher returns for investors than low earnings growth stocks.
- (C) Intel has consistently generated large profits for years.
- (D) Prices for stocks before stock splits show on average consistently positive abnormal returns.
- (E) Investors routinely misinterpret the effects of a common firm announcement.
7. The followings are sensible reasons for declines in stock market liquidity?
- I) Liquidity becomes a risk factor.
- II) Financial intermediaries face funding constraints.
- III) Market participants engage in panic selling.
- IV) Market participants respond to higher volatility in market downturns.
- V) The market becomes less efficient.
- (A) I, II, and III (B) II, III, and IV (C) I, III, and V (D) III, IV, and V
(E) II, III, and V
8. Big Silver Company has a mine that will produce a total of 80,000 pounds of silver: 30,000 pounds of silver at the end of the first year and 50,000 pounds of silver at the end of the second year. Extraction costs are always \$0.20 per pound. The current forward prices are \$0.70 per pound for a one-year contract and \$0.60 per pound for a two-year contract. The annually compounded risk-free rates are 4 percent for one-year zero-coupon bonds and 5 percent for two-year zero-coupon bonds. What is the present value of the cash flows from the mine, assuming that payments for the mined silver are received at the end of each year?
- (A) \$32,563 (B) \$32,738 (C) \$32,914 (D) \$33,471 (E) \$37,099

Calculation Question

Note: Show calculation procedure, and get zero points otherwise.

9. Firm XYZ's assets are worth \$100 today. Next year ($t = 1$), when the firm liquidates and a final dividend is paid, the asset will be worth either \$40 with a probability of 0.1, \$100 with a probability of 0.3, or \$150 with a probability of 0.6. The firm's capital structure at $t = 0$ includes the following: (a) 10 shares of common stock, and (b) zero-coupon bonds with face value = \$60, and YTM = 10%. There are no taxes in this economy, and the risk-free rate is 3% for the year. All data are in market value terms.
- (A) Calculate the share price of common stock at $t = 0$. (4 points)
- (B) Calculate the expected return of equity between $t = 0$ and $t = 1$. (3 points)
- (C) Calculate the expected return of XYZ's debt, between $t = 0$ and $t = 1$. (3 points)
- Suppose XYZ would like to re-arrange its capital structure such as to reduce the probability of bankruptcy to ZERO. Assume the weighted average cost of capital remains constant after the re-arrangement.
- (D) What is the maximum debt/asset ratio that prevents bankruptcy? (4 points)
- (E) What is the new cost of equity after the re-arrangement? (4 points)

10. Consider an economy with no taxes. Firm A (the target) has 50 outstanding shares and no debt. Firm B (the bidder) has 100 outstanding shares and no debt. Firm B is currently planning the strategy for taking over firm A. The relevant data for firms A and B are shown below:

	<u>Firm A</u>	<u>Firm B</u>
Total cash flows per year (time 1 to infinity)	\$200	\$400
Weighted average cost of capital	10%	10%

Incremental annual cash flow resulting from the merger is \$100.

- (A) What is the maximum price per share firm B can afford to pay for firm A and still make money for its own shareholders? (4 points)
- (B) What is the minimum price per share firm A's shareholders would accept if they are to tend their shares? (4 points)

