❖ 計算題務必寫出過程、使用千分位符號(,)以及小數點標示清楚

❖ 若題目沒有特別說明，請計算至小數點以下第 2 位，第 3 位四捨五入。表示方式
如1,234.56，78.09%。

$1,275,000 = $

❖ 滿分 120 分

$1,500,000 - 225,000 = 1,275,000$

1. (15分) Orange公司現在購買轎車一部，總價1,500,000元，除支付頭期款225,000
元，其餘金額辦理定額分期付款，第一筆錢於一年後開始支付，分5年本利平均
償還(每年付款一次)，利率為8%，試問每年須付多少？並作分期付款攤銷表。(注
意：四捨五入至整數位，表頭範例如下)

期數	期初餘額	每期償還	利息部份	本金部份	期末餘額

2 (10 分) The table here shows the no-arbitrage prices of securities A and B that we
calculated.

Security	Market Price Today	Cash Flow in One Year	
		Weak Economy	Strong Economy
Security A	231	0	600
Security B	346	600	0
C.	1039	600	1800

30%

a. What are the payoffs of a portfolio of one share of security A and one share of
security B? $(\frac{0-231}{2} + \frac{600-231}{2}) \div 231 = \frac{69}{231} = 0.30$. $b. 127 \div 173 = -46$
$= -0.13$
$-115.5 \quad 184.5$

b. What is the market price of this portfolio? What expected return will you earn
from holding this portfolio?

3 (15 分) Suppose security C has a payoff of $600 when the economy is weak and
$1800 when the economy is strong. The risk-free interest rate is 4%.

$13X = 12000$
$\frac{1200-X}{X} = \frac{3}{10}$
$3X = 12000 - 10X$

a. Security C has the same payoffs as which portfolio of the securities A and B in
problem 2? $(\frac{600-X}{2} + \frac{1800-X}{2}) \div X = 4\%$
$\frac{1200-X}{}$
$\frac{2400-2X}{2X} = \frac{4}{100}$
$120000 - 100X = 4X$
$120000 = 104X$
$X = 1153.85$

b. What is the no-arbitrage price of security C? 1153.85
$\frac{1200-X}{X} = -0.13$

c. What is the expected return of security C if both states are equally likely? What
is its risk premium?
$1200-X = -0.13 X$
$1200 = 0.87X$

d. What is the difference between the return of security C when the economy is
strong and when it is weak?
$X = 1379.31$

e. If security C had a risk premium of 10%, what arbitrage opportunity would be
available? $\frac{1200-X}{X} = \frac{1}{10}$
$\frac{1200-X}{X} = \frac{14}{100}$
$12000 - 10X = X$
$12000 = 11X$
$X = 10,909.09$
$14X = 120000 - 100X$
$114X = 120000$

4. (10分) In July 2012, Citigroup (C) had a market-to-book ratio of 0.43, a reflection of investors' assessment that many of Citigroup's assets (such as mortgage securities) were worth far less than their book value. At the same time, the average market-to-book ratio for major U.S. banks and financial firms was 1.2, and for all large U.S. firms it was 2.3. In contrast, Pepsico (PEP) had a market-to-book ratio of 4.8, and IBM had a market-to-book ratio of 10.7.

$$\frac{M-Equity}{B-Equity} = \frac{每股市價}{每股淨額}$$ 衡量公司的市場積效 反管理當局的附加價1 和公司甚本特性

(1). 請說明 market-to-book ratio 的定義和用途。

(2). 如果你是證券分析師,根據上述資訊,你會如何評價 Citigroup 股票? [x]

5. (10分) 請使用杜邦恆等式 (DuPont Identity) 的方法去拆解 ROE (股東權益報酬率),並說明如何提高公司的 ROE。 $ROE = \frac{Net\ income}{sale} \times \frac{Sale}{TA} \times \frac{TA}{TE}$

6. (20分) 代理問題與公司治理。

(1). (2 分) 誰是公司的所有權人?(此小題答錯要倒扣) 股東

(2). (2 分) What does the phrase *limited liability* mean in a corporate context?

(3). (2 分) 為什麼公司 (股份有限公司) 會有代理問題?(此小題答錯要倒扣)

(4). (3 分) 請問公司有哪些代理成本 (講三個就好)? 特權消費. 不認真工作、過度投資.

(5). (2 分) 請說明公司治理中 free rider 的現象。 公司治理中的小股東(相對於非管理...大股東) 沒有動機和能力去監督經理人,如仰賴

(6). (5 分) What does the phrase hostile takeover mean? Are hostile takeovers necessarily bad for firms or their investors? Explain.

(7). (4 分) 當敵意接管發生後,目標公司的可能抵抗策略有哪些 (至少寫出四個策略,並簡述這些策略的意義)? 反購併. 尋找白馬騎士. 黃金降落傘 寄出綠色郵件

7. (10分) 財務槓桿

(1). (4 分) 請問衡量公司的財務槓桿 (leverage) 的意義為何? 公司融資仰賴舉債的程度.

(2). (6 分) 一般會使用負債權益比率定義財務槓桿,為什麼負債權益比率的分子不應該包括應付帳款卻包含一年內到期之長期負債和長期負債?請問向銀行短期借款這個項目要不要納入負債權益比率的分子的計算?為什麼?

8. (6分) The British government has a consol bond outstanding paying £300 per year forever. Assume the current interest rate is 4% per year.

(1). What is the value of the bond immediately after a payment is made? $300 \times \frac{1}{0.04} = 300 \div \frac{4}{100} = 300 \times \frac{100}{4} = 7500$

(2). What is the value of the bond immediately before a payment is made? 7800.

$1058r = 42$
$r = \frac{42}{1058} \div 0.04 = 4\%$

$1100 \times \frac{1}{1+r} = 1058.$

$1100 = 1058 + 1058r.$

rf 1058.

1000.   800
576,92   0

1100.
1400
600

9. (10分) Suppose that over the next year the economy is equally likely to strengthen or weaken. A risk-free bond has no risk and will pay $1100 whatever the state of the economy, and the no-arbitrage price of this bond is $1058. A market index will pay investors $1400 if the economy is strong and $800 if it is weak, and the no-arbitrage price of this market index is $1000 4%

10%.

(1) (3 分) What is the risk-free rate? What is the expected return of the market index?
6%
$\frac{(800-1000)}{2} + \frac{(1400-1000)}{2} = -100 + 200 = 100$

What is its risk premium?
$\frac{100}{1000} = 10\%$

(2). (2 分) Why the price of the market index is lower than the risk-free bond? They both pay $1100 on average.
$\frac{600 00}{0.04} =$

(3). (5 分) Suppose that Security A will pay investors $600 if the economy is strong and nothing if it is weak. What is the no-arbitrage price of security A? If the market price of Security A is $240, what arbitrage opportunity would be available?

A.   144.23   b.   600
     1000.   800.   1400.

10. (14分) Suppose you started a Web site hosting business and then decided to return to school. Now that you are back in school, you are considering selling the business within the next year. An investor has offered to buy the business for $200,000 whenever you are ready. If the interest rate is 10%, which of the following three alternatives is the best choices? If you need $60,000 in cash now to pay for school and other expenses, would selling the business be a better choice in that case?

(1). Sell the business now.

(2). Scale back the business and continue running it while you are in school for one more year, and then sell the business (requiring you to spend $30,000 on expenses now, but generating $50,000 in profit at the end of the year).

(3). Hire someone to manage the business while you are in school for one more year, and then sell the business (requiring you to spend $50,000 on expenses now, but generating $100,000 in profit at the end of the year).

2. (1)
200,000 − 60,000 = 140,000 現值
140,000 × 1.1 = 154 000 未來值

	now.	one year.	n pv.
(1)	200,000		200,000
	____		
	200,000		
(2)	−30,000	50,000 200,000	$\frac{250,000}{1.1} - 30,000 = 197272.73$
(3)	−50,000	100,000 200,000	$\frac{300,000}{1.1} - 50,000 = 222,727.27$

−50,000.
110,000
____
60,000

300,000
− 121000
____
179,000

197 > 154

197 > 154