中國文化大學 100 學年度碩士班考試入學招生考試

系所組：財務金融學系碩士班 M-8-6

日期節次：100 年 3 月 19 日第 1 節 09：00-10：30

科目：**財務管理**

每題 25 分:

1. Nissan Motors recently reported the following information:

   - Net income = $600,000.
   - Tax rate = 40%.
   - Interest expense = $200,000.
   - Total investor-supplied operating capital employed = $9 million.
   - After-tax cost of capital = 10%.

   What is the company's EVA?

2. Please describe the strategies manager may use to maximize their firms value in the long run by managing the "Price-Earnings ratio".
   (Hint: try to analysis the components of P/E ratio.)

3. Dobson Dairies has a capital structure that consists of 60 percent long-term debt and 40 percent common stock. The company's CFO has obtained the following information:

   - The before-tax yield to maturity on the company's bonds is 8 percent.
   - The company's common stock is expected to pay a $3.00 dividend at year end (D1 = $3.00), and the dividend is expected to grow at a constant rate of 7 percent a year. The common stock currently sells for $60 a share.
   - Assume the firm will be able to use retained earnings to fund the equity portion of its capital budget.
   - The company's tax rate is 40 percent.

   What is the company's weighted average cost of capital (WACC)?

4. An analyst is interested in using the Black-Scholes model to value call options on the stock of BBS Inc. The analyst has accumulated the following information:

   - The price of the stock is $40.
   - The strike price is $40.
   - The option matures in 3 months (t = 0.25).
   - The standard deviation of the stock's returns is 0.40 and the variance is 0.16.
   - The risk-free rate is 12 percent.

Given this information, the analyst is then able to calculate some other necessary components of the Black-Scholes model:

   - d1 = 0.25.
   - d2 = 0.05.
   - N(d1) = 0.5987.
   - N(d2) = 0.5199.

   N(d1) and N(d2) represent areas under a standard normal distribution function. Using the Black-Scholes model, what is the value of the call option?

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系所組：財務金融學系碩士班

日期節次：100 年 3 月 19 日第 2 節 11：00-12：30

科目：統計學

一、從母體 $N(0,\sigma^2)$ 中隨機抽出二組獨立的樣本 $X_1,X_2,\cdots,X_n$ 與 $Y_1,Y_2,\cdots,Y_m$，試求此二組樣本之共同變異數 σ^2 之最大概似估計式，並討論此估計式之不偏性及一致性。(10%)

二、銀行欲了解存款戶月收入(萬元)(X)與其存款金額(百萬元)(Y)間關係，其資料如下：

X	32.15	55.14	48.9	25.6	40.95	19.26
Y	6	19	14	3.5	9.5	2

1.試以普通最小平方法推導截距項與斜率項之公式(10%)

2.試求迴歸模型變異數的95%信賴區間。(5%)

3.試檢定斜率是否為0.5(α= 5%)？(5%)

4.試檢定截距是否為0(α= 5%)？(5%)

(註: $\chi^2_{4,0.025}=11.1433$; $\chi^2_{5,0.025}=12.8325$; $\chi^2_{4,0.975}=0.484419$; $\chi^2_{5,0.975}=0.831209$; $t_{4,0.025}=2.776$; $t_{5,0.025}=2.571$; $t_{4,0.05}=2.132$; $t_{5,0.05}=2.015$)

三、金融業是近年來最熱門的行業之一，從業人員的月薪調查結果：

職務別	樣本數	平均月薪(萬元)	標準差(萬元)
理財專員	15	4.6	0.55
櫃檯專員	16	4.4	0.45
高階主管	10	7.4	0.50

假設各類職務的資訊從業人員的月薪均呈常態分配，且標準差均相等，試在0.05 之顯著水準下，請檢定：

1.理財專員和櫃檯專員的平均月薪是否有顯著差異。(8%)

2.高階主管的平均月薪是否至少比櫃檯專員高2萬元以上。(8%)

(註: $t_{29,0.025}=2.045$; $t_{29,0.05}=1.699$; $t_{24,0.025}=2.064$; $t_{24,0.05}=1.711$)

本試題採雙面印刷

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科目：**統計學**

四、探討 X 與 Z 兩變數對 Y 之影響，觀察得下列資料：

X	20	25.6	28	22.4	23.2	22.4	18.4	20.8
Z	17	35	8	24	6	1	8	-3
Y	11	33	22	18	14	8	6	4

1.試用最小平方法求 Y 對 X 與 Z 的迴歸方程式。(8%)

2.分別求 α、β、γ 之 95%信賴區間，而三者係數是否為 0？(9%)

3.求 R^2 與 $\overline{R}^2$。(6%)

(註: $t_{5,0.025} = 2.571$; $t_{25,0.05} = 2.015$; $t_{6,0.025} = 2.447$; $t_{6,0.05} = 1.943$; $t_{7,0.025} = 2.365$; $t_{7,0.05} = 1.895$; $t_{8,0.025} = 2.306$; $t_{8,0.05} = 1.860$)

五、X、Y和Z三地區的房地產價格是否有差異？現由三個地區的各選6所成交成屋，計算其每坪的平均售價，結果如下表：

樣本觀察值	X 地區	Y 地區	Z 地區
1	31.5	4.3	29.7
2	20.3	10.9	17.1
3	29.4	16.1	14.9
4	19.1	11.3	10.2
5	23.8	8.5	6.5
6	21.6	18.9	18.2

1.請建立ANOVA表。(10%)

2.檢定地區別是否影響房屋每坪的價格。($\alpha = 0.05$)(8%)

3.試求X和Y每坪價格差異的95%單一信賴區間。(8%)

(註: $t_{15,0.025} = 2.131$; $t_{15,0.05} = 1.753$; $F_{1,15,0.05} = 4.54$; $F_{2,15,0.05} = 3.68$)

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日期節次：100 年 3 月 19 日第 2 節 11：00-12：30

科目：經濟學

每題 25 分，請以中文作答。

1. What would be the effect on real GDP and total employment of each of the following changes?
   a. As a result of restrictions on imports into the United States, net exports (NX)increase.
   b. The federal government launches a new program to improve highways, bridges, and airports.
   c. Banks are offering such high interest rates that consumers decide to save a larger proportion of their incomes.
   d. The growth of Internet retailing leads business firms to purchase more computer hardware and software.

2. Housing prices in Boston and Los Angeles have been on a roller-coaster ride. Illustrate each of the following situations with supply and demand curves;
   a. In both cities, an increase in income combined with expectations of a strong market shifted demand and caused prices o rise rapidly during the mid-to late 1980s.

   b. By 1990, the construction industry boomed as more developers started new residential projects. Those new projects expanded the supply of housing just as demand was shifting as a result of falling incomes and expectations during the 1990-1991 recession.

3. QQS is a competitive firm operating under the following conditions: Price of output is $5, the profit-maximizing level of output is 20,000 units of output, and a total cost (full economic cost) of producing 20,000 units is $120,000. The firm's only fixed factor of production is a $300,000 stock of capital (a building). If the interest rate available on comparable risks is 10 percent, should this firm shut down immediately in the short run? Explain your answer.

4. Explain the difference between a single-price monopoly and a price-discriminating monopoly. What conditions must be present in order for a monopoly to price discriminate? Explain why each condition is necessary.