

總體經濟部分：選擇題，單選，每題五分，共十題

1. 下列何者不正確？A)物價提高增加名目貨幣需求B)物價上漲率提高增加實質貨幣需求C)名目財富增加提高名目貨幣需求D)實質所得增加提高實質貨幣需求E)名目利率提高降低實質貨幣需求

2. 設一國因資訊科技的運用致生產力上升，同時股市漲升致人民財富增加，則有A)物價上漲率提高B)經濟成長率提高C)物價上漲率下跌D)經濟成長率提高及物價上漲率降低

3. 假定台灣採浮動匯率，央行會干預外匯市場降低匯率波動幅度，且資本移動自由。若兩岸關係不睦導致資金撤離台灣，則以IS-LM-BP模型分析下列何者不會發生？A)台灣利率上升B)台幣貶值C)台灣經濟成長率降低D)台灣貨幣供給成長率降低E)台灣經常帳餘額減少

4. 有如下典型經濟模型

$$Y = f(L, K), \partial Y / \partial L > 0, \partial^2 Y / \partial L^2 < 0$$

$$Y = C(Y) + I(r) + G$$

$$M/P = L_0 + \alpha Y - \beta r$$

$$L^s = L(W/P^e), dL^s / d(W/P^e) > 0$$

$$L^d = L^d(W/P),$$

$$L^s = L^d$$

若短期中總供給線為正斜率，下列何者不是其原因？A)名目工資僵固B)物價僵固C)資方物價預期為理性預期D)勞方物價預期為適應性預期E)實質工資僵固

5. 上題模型中，若半數勞方持理性預期，半數持適應性預期，則A)事前已知的貨幣政策不能影響實質所得B)若無意外，經濟永遠處於充分就業C)意外的貨幣政策較已知的貨幣政策對名目所得影響大D)意外的貨幣政策較已知的貨幣政策對實質所得影響大E)貨幣供給增加在長期中不會使物價等比例上揚

6. 下列何者不是去年921地震對去年第四季經濟的影響？A)失業率提高B)財富受損導致消費支出減少C)民間重建投資支出增加D)政府賑災物資導致總供給線右移

7. 若你是一位債券的投資者，則聽到下列何新聞你比較傾向於賣出債券？A)美國調高其利率B)經濟成長率如預期攀高C)過去一年物價上漲率提高D)未來物價上漲率如預期攀高E)主計處調高對物價上漲率的預測

8. 簡單凱因斯模型中，縱軸是支出，橫軸是A)國民所得B)國民所得淨額C)可支配所得D)個人所得E)假定以上四者皆相等

9. 以一般IS線及LM線將平面分為四部分，若實際經濟處於IS之右及LM之左，則有A)均衡所得大於實際產出B)均衡所得小於實際產出C)意外的存貨增加D)計畫中的存貨增加E)貨幣需求大於貨幣供給

10. 有如下典型經濟模型

$$Y = f(L, K), \partial Y / \partial L > 0, \partial^2 Y / \partial L^2 < 0$$

$$Y = C(Y) + I(r) + G$$

$$M/P = L_0 + \alpha Y - \beta r$$

$$L^s = L(W/P), dL^s / d(W/P) > 0$$

$$L^d = L^d(W/P),$$

設有 $L^d > L^s$ ，且名目工資有僵固性，則如何才能獲致充分就業均衡？A) 提高勞動生產力 B) 增加資本設備 C) 緊縮貨幣 D) 擴張貨幣 E) 擴張政府支出

個體經濟部份 (共 50 分)

(1) 某代表性消費者其效用函數可用 $U(X_1, X_2)$ 代表之。其中 P_1, P_2 為 X_1 及 X_2 之市場價格， M 為消費者之所得， (P_1, P_2, M) 均為外生變數。

(i) 請導出該消費者在作最適消費決策 (X_1^*, X_2^*) 時之數學 Program 以及其一階條件式 (First Order Conditions)。(5 分)

(ii) 若外生變數 M 改變時，該消費者最適購買量 (X_1^*, X_2^*) 會如何改變？

(i.e. 請導出 $\frac{\partial X_1^*}{\partial M}$ 以及 $\frac{\partial X_2^*}{\partial M}$) 在經濟學中，我們通常稱此種改變為何種「效果」？(5 分)

(iii) 若外生變數 P_1 改變時，其最適購買量 (X_1^*, X_2^*) 會如何改變？

(i.e. 請導出 $\frac{\partial X_1^*}{\partial P_1}$ 以及 $\frac{\partial X_2^*}{\partial P_1}$) (5 分)

(iv) 請以 $\frac{\partial X_1^*}{\partial P_1}$ 之方程式說明 Slutsky Equation (價格變動之總效果 = 所得效果 + 替代效果) 之組成。您尤其需要說明您如何認定「替代效果」？(5 分)

(2) 有一個賭局，其遊戲規則如下：

連續丟一個 10 元的銅板，若「人頭」連續出現 t 次，則參與者可得 2^{t-1} 元的獎金，但是當擲出「拾圓」時，則此一賭局便告結束 (此一賭局便是有名的 St. Petersburg Paradox)。

(i) 請問此一賽局之預期值為何？(請寫出您的計算式) (3 分)

(ii) 若某一個人其 $N-M$ 預期效用函數為 $u(\omega) = \log \omega$ ，若該員並沒有任何期初之財富，則此一賽局對該員而言，值多少無風險的現金？(4 分)

(iii) 請說明 (i) 和 (ii) 為何會有差異？(3 分)

(3) 請說明下列觀念：

(i) 何謂「自然獨占」？(2 分)

(ii) 「自然獨占」的廠商其成本結構具有何種特性？(3 分)

(iii) 某一具有「自然獨占」特性的廠商，其產品及服務可否透由自由競爭的市場所提供？(2 分)

(iv) 請舉出 3 個具有「自然獨占」特性之產業。(3 分)

(4) (i) 何謂市場失靈 (Market Failure)？請加以定義。(4 分)

(ii) 在那些情況下，可能會出現市場失靈的狀況？(6 分)
(請最少舉出 4 種情況，以及其可能的補救措施)

I. 單選題 (15 questions, 4 points each, 60 points)

1. Which of the following has been offered as a possible explanation for why securities in an IPO are underpriced when they are issued?
- I. Underwriters typically underprice high-priced stocks so more investors can afford them.
 - II. Underwriters underprice so that the average investor will lose money on initial public offerings.
 - III. Underwriters underprice to minimize lawsuits by investors, which could occur if they consistently overpriced stocks.
- A. I only B. I and II only C. II and III only
D. III only E. I, II, and III

2. According to CAPM (Capital Asset Pricing Model), Which of the following statements is/are correct?
- I. The higher an asset's return, the higher its risk.
 - II. An asset's return is determined by its market risk only.
 - III. It assumes that investors all invest through portfolios.
- A. I only B. II only C. III only
D. I, and II only E. I and III only

3. Which of the followings can be treated as an option?
- I. Convertible Bonds II. Stock Warrants
 - III. Preferred Stocks IV. Common Stocks
- A. I and II only B. I and III only C. II and III only
D. I, II and III only E. I, II and VI only.

4. Regarding with "Market Efficiency", which of the following statement is/are correct?
- I. Strong-form efficiency does not exist in any real market in the world.
 - II. The popular usage of technique analysis rejects the weak-form efficiency assumption.
 - III. The fluctuation of prices proves that the market is inefficient in any form.
- A. I only B. II only C. III only
D. I and II only E. I and III only.

5. In evaluating a long-term investment project, NPV (Net Present Value) is the most recommended method because
- I. It always provides the most correct answer in any cases.
 - II. It brings the adding-value to share-holders which other methods can not accomplish.
 - III. It considers the time value of money, which other methods do not.

- A. I only B. II only C. III only
D. I, and II only E. I and III only

6. Regarding with derivative securities, which of the following statements is/are correct?

- I. All else being equal, an American option has more value than a European option with the same term.
II. All else being equal, a future has more value than a forward contract with the same term.
III. All else being equal, a derivative security has more value than its underlying asset

- A. I only B. II only C. III only
D. I, and II only E. I and III only

7. Based on MM's Theory of capital structure, which of the following statements is/are incorrect?

- I. Without considering taxes and bankruptcy costs, the value of a firm is determined by its investment policy, not by its capital structure policy.
II. Considering taxes and bankruptcy costs, capital structure would matter because the risk of shareholders can be transferred to debt-holders if firms use debt.
III. Optimal structure is reached when benefit of tax-shield is greater than cost of bankruptcy

- A. I and II only B. I and III only C. II and III only
D. II only E. III only

8. All else being equal, which of the following would increase the length of a firm's cash cycle? Consider each in isolation of one another.

- I. Inventory turnover is increased
II. Accounts Receivable period is increased
III. Accounts Payable period is decreased

- A. I only B. II only C. III only
D. I, and II only E. II and III only

9. After the implementation of 兩稅合一, which of the following statements is/are correct ?

- I. Dividend pay-out ratio should increase because effective tax rate (to investors) on dividends, on average, decreases.
II. Dividend pay-out ratio should remain the same based on MM Theory of dividend policy.
III. Dividend pay-out ratio should increase because retained earnings are taxed.
IV. Stock price drop on ex-dividend dates should narrow.

- A. I only. B. II only. C. I and III.
D. II and IV. E. I, III and IV.

10. Company A is thinking of changing its capital structure by issuing debt to buy back stock. Which of the following principles should be used ?

- I. MM Theory of capital structure.
II. Expected return on assets (r_{assets}) remains the same.
III. Corporate tax rate can be ignored.
IV. Present value of tax shield should be considered.

- A. I and IV. B. II and IV. C. III and IV. D. IV only.
E. I, II and IV.

11. Which of the following reasons for mergers and acquisitions (併購) make sense (i.e., good reasons) ?

- I. Synergy
II. Diversification (企業多角化)
III. Cost reduction.
IV. Efficiency improvement.

- A. I. B. I, III, and IV. C. I, II, III and IV. D. III. E. IV.

12. Company B's stock price decreases when Company B announces to make a seasoned equity offering (現金增資). Which of the following reasons is/are correct ?

- I. Managers make a seasoned equity offering when the stock is overpriced.
II. The number of stock will increase after the seasoned equity offering and, thus, EPS will decrease.
III. The money raised from the seasoned equity offering will be invested in a positive NPV project.

- A. I only. B. II only. C. I and II. D. I, II and III. E. None of above.

13. Mutual fund K and the market portfolio have the following performance:

	<u>Mutual Fund K</u>	<u>Market portfolio</u>
Average return	18%	14%
Standard deviation	30%	22%
Beta	1.4	1.0

Should you recommend mutual fund K to investors who already invested in many risky assets ? Risk-free rate is 5% per year.

- A. Yes, based on average return and standard deviation.
B. Yes, based on average return and Beta.
C. No, based on average return and standard deviation.

國立中山大學八十九學年度碩博士班招生考試試題

科目：財務管理

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- D. No, based on average return and Beta.
E. Yes, based on average return.

14. Firm A plans to buy B. Before the announcement,

	Firm A	Firm B
share price	\$20	\$10
Number of stocks	25	10
Equity (book value)	400	80

Assume synergy = \$120. Firm A pays cash \$180 to buy B. What is the NPV of this merger to firm A ?

- A. 40 B. 20 C. 80 D. 100 E. None of the above.

15. When a company issues debt, what happens to the firm's shareholders ?

- I.. Expected return on equity increases.
II. Beta of equity remains the same.
III, Tax shield from debt remains the same.
IV. Expected return on assets remains the same even when tax rate is not zero.

- A. I B. II C. III D. IV. E. I and IV.

II. Essay/ Computation Problems (4 questions, 10 points each, 40 points)

1. Please explain and contrast the following four risk measures

- (1) Standard Variation
- (2) Co-efficient of Variance
- (3) Beta
- (4) VAR (Value At Risk)

2. You must bid to supply 3 machines per year for each of the next three years to a company. To get set up, you will need \$1,000,000 in equipment, to be depreciated straight-line to zero over three years, with no salvage value. Total fixed costs per year are \$500,000, and variable costs are \$700,000 million per machine. Assuming a tax rate of 30% and a required return of 10%, you should offer to supply the jets at a minimum price of how much? Please show computation steps for partial credit. (note: PVIFA(10%, 3 years)=2.4869)

3. Companies A and B have decided to merge (合併). Both companies have debt outstanding and the new firm is responsible for this debt.

Suppose there are no economic gains (or synergy 綜效) from this merger. Will the market value of original Company A's equity (原 A 公司股東權益) increase, decrease, or remain the same as a result of this merger ? How about the market value of original Company A's debt ? Why ? Suppose (1) transaction cost of this merger is zero and (2) takeover premium (接管溢價) is zero.

4. Assume that well-diversified portfolios X and Y have the following characteristics:

<u>Portfolio</u>	<u>Expected annual return</u>	<u>Beta</u>
X	16%	1.0
Y	14%	0.25

Construct a strategy to earn a profit at no risk. Risk-free rate=3%.

5

10

15

20

25

30

國立中山大學八十九學年度(碩)博士班招生考試試題

科 目：統計學

財務管理學系碩士班

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一、填空题：請根據 A、B 兩子題之題意或題目給予之訊息，直接將最終(final)答案填入底下(1)-(25)各空格內，每空格 2 分，共計 50 分。

A. 設 X_1, X_2, \dots, X_n 分別自常態母體 $N(\mu_1, \sigma_1^2), N(\mu_2, \sigma_2^2), \dots, N(\mu_n, \sigma_n^2)$ 抽出之一組隨機樣本，並令 $Z = \sum_{i=1}^n k_i X_i$ ， k_i 為 constant， $\forall i$ ，為此組隨機樣本之線性組合，則統計量 Z 的抽樣分配平均數為 (1)，變異數為 (2)。根據以上題意，若假設 $\mu_1 = \mu_2 = \dots = \mu_n$ ，而且， $\sigma_1^2 = \sigma_2^2 = \dots = \sigma_n^2$ ，則可視 (X_1, X_2, \dots, X_n) 係抽自同一常態母體，如此，若令 $k_i = \frac{1}{n}, \forall i$ ，則 Z 的抽樣分配平均數為 (3)，變異數為 (4)。若設 $Z_i = \frac{X_i - \mu}{\sigma}$ ，則 Z_i 的抽樣分配平均數為 (5)，變異數為 (6)。若設 $Z_i^2 = \left(\frac{X_i - \mu}{\sigma}\right)^2$ ，則 Z_i^2 的抽樣分配平均數為 (7)，變異數為 (8)；而 $\sum_{i=1}^n Z_i^2$ 的抽樣分配平均數為 (9)，變異數為 (10)。

B. 設一線性假說模式： $X_{ij} = \mu_{..} + \alpha_i + \beta_j + \varepsilon_{ij}$ ，式中， $\alpha_i = \bar{X}_{i.} - \bar{X}_{..}, i = 1, 2, \dots, r$ ， $\beta_j = \bar{X}_{.j} - \bar{X}_{..}, j = 1, 2, \dots, c$ ， $\bar{X}_{i.} = \frac{1}{c} \sum_{j=1}^c X_{ij}$ ， $\bar{X}_{.j} = \frac{1}{r} \sum_{i=1}^r X_{ij}$ ， $\bar{X}_{..} = \frac{1}{rc} \sum_{j=1}^c \sum_{i=1}^r X_{ij}$ ，而且， $X_{ij} \stackrel{iid}{\sim} N(\mu_{ij}, \sigma^2)$ ， $\varepsilon_{ij} \stackrel{iid}{\sim} N(0, \sigma^2)$ ，並分別令： $RSS \equiv \sum_{i=1}^r (\bar{X}_{i.} - \bar{X}_{..})^2$ ， $CSS \equiv \sum_{j=1}^c (\bar{X}_{.j} - \bar{X}_{..})^2$ ， $TSS \equiv \sum_{j=1}^c \sum_{i=1}^r (X_{ij} - \bar{X}_{..})^2$ ， $USS \equiv \sum_{j=1}^c \sum_{i=1}^r (X_{ij} - \bar{X}_{i.} - \bar{X}_{.j} + \bar{X}_{..})^2$ ，則： $E(\bar{X}_{i.}) =$ (11)， $E(\bar{X}_{.j}) =$ (12)， $E(\bar{X}_{..}) =$ (13)， $Var(\bar{X}_{i.}) =$ (14)， $Var(\bar{X}_{.j}) =$ (15)。統計量 $\frac{RSS}{\sigma^2/c}$ 的機率分配為 (16)，統計量 $\frac{CSS}{\sigma^2/r}$ 的機率分配為 (17)，統計量 TSS/σ^2 的機率分配為 (18)，而由於前述三種統計量均互相獨立，所以，統計量 USS/σ^2 的機率分配為 (19)。根據以上，當我們欲檢定 $H_0^{(1)}: \alpha_i = 0, \forall i$ 時，統計量 $c(c-1) \frac{RSS}{USS}$ 的機率分配為 (20)，而當我們欲檢定 $H_0^{(2)}: \beta_j = 0, \forall j$ 時，統計量 $r(r-1) \frac{CSS}{USS}$ 的機率分配為 (21)。在顯著水準 α 下，當第(20)格的統計值大於 (22) 時，我們摒棄 $H_0^{(1)}$ ，而當第(21)格的統計值大於 (23) 時，我們摒棄 $H_0^{(2)}$ ；綜合以上，若我們只欲單獨檢定 $H_0^{(1)}$ 或 $H_0^{(2)}$ 其中之一是否可被接受，其分析程序稱之為 (24) 變異數分析法，而若我們欲同時檢定 $H_0^{(1)}$ 及 $H_0^{(2)}$ 是否均可被接受，其分析程序稱之為 (25) 變異數分析法。

第二部份，共 50 分

1. 假設樣本空間(Sample Space) S 包括四個要素(Elements)即： $S = \{a_1, a_2, a_3, a_4\}$ 。試找合乎 S 機率空間(Probability Space)之條件。(5 分)
2. 隨機抽取 25 個樣本均數之標準差為 $20(\sigma_x)$ 。今若欲將精確度(Precision)提高一倍(即標準差減低一半)。試問選樣策略為何?(5 分)
3. True and False(是非題)，to get full credit you must justify your answer。
 - (1) A result significant at the 10% level is obviously also significant at the 5% level。(5 分)
 - (2) If event A and B are independent, then $P(A \text{ and } B) = 0$ 。(5 分)
 - (3) The probability that in three random digits there is at least one '9' is $0.1 + 0.1 + 0.1 = 0.3$ 。(5 分)
 - (4) A standard deviation can never be greater than an average。(5 分)
 - (5) If event A and B in a sample space are collectively exhaustive, then it follows that $P(A) + P(B) = 1$ 。(5 分)
4. 看圖解釋，以下為台灣上市公司宏碁科和亞旭股價日線圖形(摘自工商日報)。在宏碁科(12/28/88-3/6/89)和亞旭(11/24/88-3/20/89)樣本期間，試解釋個股股價之
 - (1) 平均數之特性。(5 分)
 - (2) 變異數之特性。(5 分)
 - (3) 並扼要建議可能操作策略以得最佳投資報酬。(5 分)

