個體經濟學部份

(I) 選擇題（請選出最適當之答案）每題 2.5 分，共 50 分

1. When a perfectly competitive firm attains long-run equilibrium, it is certain to be operating at an output level at which its long-run average cost curve:
   a) is falling.
   b) is falling or attains a minimum.
   c) is rising.
   d) attains a minimum or is rising.

2. If a perfectly competitive industry is in short-run equilibrium, we can be sure that:
   a) all producers in the industry are making a profit.
   b) every producer who is supplying output is making a profit.
   c) all producers who are supplying output are making the same profit.
   d) every producer who is supplying output is producing at a point where market price equals his marginal cost.

3. According to the law of diminishing returns, the *marginal product* of labor employed in a production process that also uses fixed inputs:
   a) must rise initially as labor inputs are increased.
   b) must fall eventually as labor inputs are increased.
   c) must exceed AP_L over some range of labor inputs.
   d) must exceed AP_L over all range of labor inputs.

4. The production function facing a firm will change whenever:
   a) input prices change.
   b) the firm employs more of any variable input.
   c) relevant technology changes.
   d) the firm increases its level of output.

5. In any production process, the marginal product of labor equals:
   a) the value of total output minus the cost of the fixed capital stock.
   b) the change in total output that occurs when a one-unit change is made in labor inputs.
   c) total output divided by total labor inputs.
   d) total output produced with the given labor inputs.

6. If the market demand curve is inelastic at any point, we can be sure that, at the quantity level corresponding to this point, marginal revenue:
   a) will be positive.
   b) will be zero.
   c) will be negative.
   d) will exceed average revenue.

7. If an individual selling in a perfectly competitive market wants to double the amount he sells in this market, he:
   a) should lower price.
   b) should advertise his product.
   c) should take steps to increase the elasticity of demand for his output.
   d) need only double his output and the amount he offers for sale.

8. For a producer who sells in a perfectly competitive market and who attains short-run equilibrium by supplying the output level that equates marginal cost with market price, all of the following statements will hold except:
   a) average variable cost is certain to be minimized.
   b) marginal revenue will equal marginal cost.
   c) marginal revenue will equal average revenue.
   d) profits will be maximized.

9. If the market demand curve is linear and negatively sloped, we can be sure that:
   a) it will have unitary elasticity everywhere.
   b) the slope of the market demand curve will be everywhere the same but elasticity will fall as quantity sold is increased.
   c) price elasticity will be everywhere greater than one.
   d) price elasticity will be everywhere less than one but greater than zero.

10. A monopolist with positive MC would never maximize profits by producing at which of the following points:
    a) the one where TR is maximized.
    b) one where AVC is falling.
    c) one where MC is falling.
    d) one where the price elasticity of demand for his output was less than one.

11. A monopoly position is *certain* to offer profits to the firm exercising it in which of the following situations:
    a) the firm is also a monopolist.
    b) the firm's MR curve intersects its MC curve at the point where MC equals ATC.
    c) the firm's MR curve intersects its MC curve twice.
    d) the firm's ATC curve lies at some output levels below its AR curve.

12. For a market to be perfectly competitive, all of the following conditions must hold except:
    a) buyers must behave as price takers.
    b) the market demand curve must be horizontal.
    c) sellers must behave as price takers.
    d) the product sold must be homogeneous.

13. In the special case in which all monopolistic competitors in a given group are assumed to face identical cost and revenue curves, the profits that these firms earn in long-run equilibrium will, assuming free exit and entry:
    a) be substantial if they avoid price competition.
    b) be zero.
    c) be substantial if they avoid nonprice competition.
    d) be substantial if exit from the group is limited.

14. The imposition of a tax on the sale of a product traded in a perfectly competitive market will have no effect in the short run on the quantity of output traded in which of the following situations:
    a) the tax is imposed on buyers of the product.
    b) The tax is small.
    c) market demand for the product has zero elasticity.
    d) market supply of the product has zero elasticity.

15. The means by which a producer can seek to differentiate his product form that of his competitors include all of the following but:
    a) changing the ingredients he puts in his product.
    b) changing the price at which he sells his product.
    c) changing the way he packages his product.
    d) changing the properties he attributes to his product in advertising.

16. A perfectly competitive economy would not achieve a Pareto optimal allocation of resources in production in the presence of which of the following conditions:
    a) the government requires large producers to pay a tax on the labor they employ but exempts small firms from the tax.
    b) the government imposes a minimum wage that exceeds the wage that would equate the supply of and demand for unskilled labor.
    c) externalities exist in consumption; i.e., the utility of some consumers depends in part on the goods consumed by other individuals.
    d) the economy, while it is operating at a point on its production possibility frontier, is not operating at the point necessary for obtaining constrained bliss.

17. In a certain economy, producers of commodity X impose external diseconomies on producers of other outputs. For resource allocation in this economy to be Pareto optimal:
    a) production of commodity X must be halted altogether.
    b) consumption of commodity X must be discouraged.
    c) commodity X must be sold at a price equal to its social marginal cost.
    d) commodity X must be made a public good.

18. In any economy in which all markets are perfectly competitive, the allocation of consumption goods is efficient (i.e., Pareto optimal) because:
    a) in such an economy production is efficient.
    b) all consumers will be maximizing their satisfaction relative to the same set of commodity prices, and, consequently, they will all have identical rates of commodity substitution between any pair of consumption goods.
    c) the social welfare function is defined in such a way that any point of general equilibrium in a competitive economy maximizes social welfare; i.e., corresponds to a point of constrained bliss.
    d) perfect competition permits the economy to consume at a point beyond (i.e., above) the production possibility frontier.

19. To move in a two-good, two-person economy from the contract curve in the Edgeworth box to the utility-possibility frontier, we need to know:
    a) the initial endowments possessed by both consumers of both goods.
    b) the competitive structure of the market in which the two goods are traded.
    c) the point on the contract curve the two consumers reach through trading.
    d) the level of utility that corresponds to each one of both consumers' indifference curves.

20. If a two-input, two-output economy is operating at a point along its production possibility curve, which of the following is not true:
    a) production is Pareto optimal.
    b) consumption is Pareto optimal.
    c) all producers in both industries have identical rates of technical substitution between both inputs.
    d) the output of one good could not be increased without decreasing the output of the other good.

總體經濟部分（一般生）

選擇題，單選，每題5分，共25分

1. 若名目貨幣供給與國庫券利率有同時走高的現象，此現象與下列何敘述有衝突？ A)經濟成長提高貨幣需求 B)物價上漲率預期提高 C)持有國庫券的風險增加 D)物價上漲 E)國庫券發行減少

2. 設定期存款的存款準備率0.2，活期存款的存款準備率0.1，且銀行系統不保有超額準備，某乙以外的民眾亦不持有現金。若某甲自銀行提定期存款1,000元向某乙購買債券一張，則下列何者有誤？ A)若某乙將1,000元回存銀行定期存款則M2不變 B)若某乙將1,000元回存銀行活期存款則M2增加 C)若某乙將1,000元以現金形態持有則M1增加 D)若某乙將1,000元以現金形態持有則M2減少 E)若某乙將1,000元以現金形態持有則銀行存款準備金減少

3. 令上標p代表預擬的，上標r代表實現的，簡單凱因斯模型中，若實際所得不為均衡所得則 A)$Y = C^r + I^r$ B)$S^p = I^r$ C)$I^r = I^p$ D)$Y = C^p + I^p$ E)$Y = S^p + C^p$

4. 最近半年馬來西亞泰國印尼發生金融危機，若與未發生危機之前相較，目前各國所出現的共同現象不包括 A)物價上漲率上揚 B)經濟衰退 C)貨幣貶值 D)貿易餘額改善 E)利率下跌

5. 總需求線為負斜率的原因包括？ A)物價上升導致替代效果 B)物價上升導致所得效果 C)物價上升導致名目貨幣供給減少 D)物價上升導致進口減少 E)物價上升導致實質餘額效果

計算及簡答題，每題5分，請直接寫答案，不必列出算式

1. 農夫進口10000元之肥料，生產500,000元小麥，全部售予麵粉廠，政府當年發放農夫老人年金80,000元。麵粉廠以年薪100,000雇用外勞，留下200,000元小麥供下年度使用，其餘小麥則製成1,000,000麵粉，其中300,000出口，50,000直接售予家庭，其餘製成900,000麵包；麵包100,000售予國防部作為軍人口糧，外勞亦購20,000，其餘則售予家庭。麵粉廠老闆當年繳營業稅50,000，所得稅40,000，其海外投資收入有100,000。請計算當年國民所得帳中C=? I=? G=? X-M=? 要素在國外所得淨額=?

2. (一)某成衣廠去年底有價值500萬成衣未出售，今年底則共有成衣200萬未出售。(二)某飼料工廠所產飼料今年因口蹄疫滯銷，飼料存貨增加120萬元，另所進口黃豆原料亦增加100萬元存貨。考慮以上事件，在今年國民所得帳中，共若干元計入存貨變動項下？

3. 有如下IS-LM-BP模型
$$Y = C + I + G + NX$$
$$C = 100 + 0.8(Y - T)$$
$$I = 200 - 100i$$
$$M/P = 100 + 0.3Y - 100i$$
出口淨額 $NX = 500 - 0.5Y + 10e$
資本淨流出 $NCO = 100 - 50(i - i^*)$
其中i代表利率，i*代表國外利率，e代表匯率。在浮動匯率之下，設G與T同增100，則均衡所得變動若干？

4. 簡單凱因斯模型中，若自發性消費增加，則APC提高。欲使上列敘述成立，自發性消費與誘發性消費須呈現何種關係？
(以15字以內說明，超過字數不予計分)。

5. LM模型中縱軸代表名目利率或實質利率? 為何? (以30字以內說明，超過字數不予計分)。

I. Multiple Choice
(60 points, 3 points each question)

1. Options can be used to view a firm from both a:
   a. call written by the bondholders or a put bought by the bondholders.
   b. put sold by the bondholders or a call written by the bondholders.
   c. put sold by the shareholders and a call written by the shareholders.
   d. call written by the shareholders and a put bought by the shareholders.
   e. none of the above.

2. Suppose that pencils sell in the U.S. for $3.00 per gross, while in London, the price is 2.00. Suppose that the exchange rate is $1.75 per pound. Given this scenario, which of the following will likely take place in the absence of market frictions?
   a. Many pencils would move from the U.S. to London.
   b. Many pencils would move from London to the U.S.
   c. The price of pencils in the U.S. would rise.
   d. Both a and b.
   e. Both a and c.

3. In the One Factor (APT) Model, the characteristic line to estimate $\tilde{A}_i$ passes through the origin, unlike the estimate used in the CAPM because:
   a. the relationship is between the actual return on a security and the market index.
   b. the relationship measures the change in the security return over time versus the change in the market return.
   c. the relationship measures the change in excess return on a security versus GNP.
   d. the relationship measures the change in excess return on a security versus the change in the factor about its mean of zero.
   e. cannot be determined without actual data.

4. The P/E ratio is a multiple of earnings that investors pay for a stock. The P/E is _____ related to growth, _____ related to the discount rate, and _____ related to the stock's risk.
   a. positively, positively, negatively.
   b. negatively, positively, positively.
   c. positively, negatively, negatively.
   d. negatively, negatively, positively.
   e. none of the above.

5. The total number of variance and covariance terms in portfolio is N^2. How many of these would be covariances?
   a. N^2
   b. N^2
   c. $N^2 - N$
   d. $N^2 - N/2$
   e. none of the above.

6. Which of the following factors influence the choice between merger and an acquisition of stock?
   a. Shareholders are dealt with directly to bypass target management and board of directors in an acquisition of stock.
   b. In a tender offer, some minority shareholders may not tender preventing complete firm absorption.
   c. Target management may be unfriendly and resist an acquisition offer. Resistance usually make the stock price higher.
   d. all of the above.
   e. none of the above.

7. A firm has 100 shares of stock and 40 warrants outstanding. The warrants are about to expire, and all of them will be exercised. The market value of the firm's assets is $2,000, and the firm has no debt. Each warrant gives the owner the right to buy 2 shares at $15 per share. What is the price per share of the stock?
   a. $15.00.
   b. $17.78.
   c. $11.11.
   d. $20.00.
   e. None of the above.

8. Financial managers must be cognizant of market efficiency because:
   a. manipulating earnings by accounting changes does not fool the market.
   b. timing security sales is futile because without private information the current price reflects all known information.
   c. there is limited price pressure from any large sale of stock depressing prices momentarily which then recover to prior levels.
   d. all of the above.
   e. none of the above.

9. Donny Dell Inc. had a days in inventory (based on 365 days) of 5. Cost of goods sold were $4,380. Net working capital was $80 and total current assets were $400. What is Donny Dell's quick ratio?
   a. 5.000
   b. 1.794
   c. 1.063
   d. 2.400
   e. none of the above.

Question 10 refers to the following:

A mortgage banker makes a commitment today to make loans to various first time homebuyers in one month at a stated rate of interest.

10. To protect against interest rate risk, the mortgage banker should:
    a. buy bond futures, as this position will hedge loses if rates rise.
    b. sell bond futures, as this position will hedge losses if rates rise.
    c. sell bond futures, as this position will add to his gains if rates rise.
    d. buy bond futures, as this position will add to his gains if rates rise.
    e. none of the above.

11. If a company changes its capital structure:
    a. Its debt beta will not change.
    b. Its common stock beta will not change.
    c. Its asset beta will not change.
    d. Its preferred stock beta will not change.
    e. All of the above are correct.

12. Using the company's cost of capital to evaluate a project is:
    a. Always correct.
    b. Always wrong.
    c. Correct only for those companies which have stable cash flows.
    d. Correct only for projects which are as risky as the average of the company's assets.
    e. Correct only for the companies whose managers maximize the shareholders' value.

13. Which of the following statement is true?
    a. A firm that earns the opportunity cost of capital is earning economic rents.
    b. A firm that invests in positive net-present-value projects expects to earn economic rents.
    c. A firm that invests in zero net-present-value ventures expects to earn economic rents.
    d. Economic rents are net cash flows of investment projects.
    e. A firm whose managers conduct insider trading cannot earn economic rents.

14. Which of the following would be of interest to a fundamental analyst, who evaluates the prospects of a firm?
    a. Recent stock price behavior.
    b. Information about a new product under development in the firm.
    c. The relationship between the stock price and the Taiwan Value-weighted Index.
    d. The location of the firm's headquarter.
    e. None of the above.

15. The price of a stock tends to decline when the company issues additional common shares because:
    a. Other things being equal, increased supply implies a decrease in price.
    b. Earnings per share will decrease because the number of common shares outstanding increase.
    c. The financial market anticipates that managers will issue stock when they think the stock is overvalued.
    d. The value of the firm's assets remains the same, while the number of shareholders increase.
    e. None of the above.

16. An investor buys one share of stock and a put option on the stock and simultaneously sells a call option on the stock with the same exercise. What will be the value of his investment on the final exercise date ?
   a. Higher than the exercise price if the stock price rises and lower than the exercise price if it falls.
   b. Equal to the exercise price regardless of the stock price.
   c. Equal to zero regardless of the stock price.
   d. Lower than the exercise price regardless of the stock price.
   e. Higher than the exercise price regardless of the stock price.

17. A dividend is unexpectedly paid on the common stock, the warrant holder:
   a. Loses value.
   b. Gains value.
   c. Is unaffected.
   d. May gain or lose, depending on other factors, such as stock price variance.
   e. None of the above.

18. Which of the following is not a sensible reason for merger ?
   a. Elimination of inefficiencies.
   b. Economies of scale.
   c. Ability to use tax shields.
   d. Diversification.
   e. Complementary resources.

19. Which of the following is correct in capital budgeting process ?
   a. Ignore incremental cash flows.
   b. Include working capital requirements.
   c. Exclude opportunity costs.
   d. Include sunk costs.
   e. None of the above.

20. If the depreciation amount is $100,000, the marginal tax rate is 25% and the average tax rate is 35 %, then the tax shield due to depreciation is:
   a. $100,000.
   b. $25,000.
   c. $35,000.
   d. $75,000.
   e. $65,000.

II. Essay or Calculation
(40 points, 10 point each problem)

1. According to Black-Scholes-Option Pricing Model, there are five factors influencing the price of an option. What are they? How do they influence the option price? (hint: positively or negatively)

2. Please define the terms of "Operating Leverage" and "financial Leverage", and give numerical examples explaining their usage in financial management.

3. Travelovers Group announces to acquire (i.e., buy) City Bank. Basic financial data for the two companies are as follows:

	Travelovers Group	City Bank
Number of common shares outstanding before the merger:	2,000,000	1,000,000
Share price before the announcement :	$ 30	$40

The merger is financed by an exchange of common stock (股票交換). Specifically, Travelovers Group agrees to issue additional 1,000,000 shares of Travelovers Group's common stock to City Bank's shareholders. In return, City Bank's shareholders tender (i.e., give) all of their shares of City Bank to Travelovers Group. Suppose the merger will result in a synergy (綜效) of $20,000,000. In other words, the value of the two companies operated as a single corporation is $120,000,000. (a) How much do Travelovers Group's shareholders gain (or lose) from this merger ? (b) What is the maximum number of shares that Travelovers Group can offer such that the merger is worthwhile (i.e., a positive net-present-value project) to Travelovers Group ?

4. You are a financial consultant to John, who intends to invest $2 million in a fund. A famous fund manager comes forward and offers the following investment contract to John:

> The mutual fund will invest the money in the stock market for one year. Suppose at the end of one year, the future value of this fund is X. If X is greater than $2 million, the fund manager will receive one half of (X – 2,000,000) as the management fees (管理費). If X is less than $2 million, the fund manager must bear (承擔) the loss. That is, John will still have $2 million if X is lower than 2,000,000.

Will you recommend John accept this contract ? Why ?

一、填空題（關於統計假設檢定之基本觀念）：下列共有 15 個空格，請將正確答案填入空格代號，每格 2 分，計 30 分。

- 真實的虛無假說被拒絕之可能風險稱為　(1)　，又稱為　(2)　；錯誤的對立假說誤被接受之可能風險稱為　(3)　；對立假說為真時，檢定統計量之絕對值小於臨界值之機率稱為　(4)　，而虛無假說為真時，檢定統計量之絕對值小於臨界直之機率為　(5)　，此一機率值相當於進行區間估計時　(6)　之概念。

- 在　(7)　情況下，檢定結果，兩種類型的可能風險之發生，係絕對不可避免，因此，欲同時降低兩種類型之可能風險，唯一之辦法乃是　(8)　。

- 在複合假說(compositive hypothesis)下，錯誤的對立假說誤被接受之可能風險與對立假說下之母體參數，彼此之間有函數關係，此種函數關係稱為　(9)　，倘再以 1 減之，則其函數關係稱為　(10)　。

- 檢定結果，若拒絕虛無假說，則稱為　(11)　，反之，若接受虛無假說，則稱為　(12)　；在前者情況下，檢定統計量之絕對值必　(13)　臨界值，在後者情況下，檢定統計量之絕對值必　(14)　臨界值。

- 綜合以上所述，此種統計假設檢定，在統計決策理論上，稱為　(15)　問題。

二、已知一母體分配為 $f(x) = \left(\frac{2}{3}\right)^x \left(\frac{1}{3}\right)^{1-x}$，$x = 0,1$。現從此一母體抽出一組隨機樣本 X_1, X_2, X_3，並分別組成統計量 $\bar{X}$ 及 S^2，其中，$S^2 = \frac{1}{3}\sum_{i=1}^{3}\left(X_i - \bar{X}\right)^2$

1. 寫出此組隨機樣本的概似函數(likelihood function)。（本小題 5 分）
2. 列出統計量 $\bar{X}$ 的抽樣分配(sampling distribution)，並求 $E(\bar{X})$ 及 $Var(\bar{X})$。（本小題 5 分）
3. 推求統計量 S^2 抽樣分配的 $E(S^2)$ 及 $Var(S^2)$。（本小題 10 分）

三、以下資料分別代表台灣加權股價指數(簡稱指數)和台灣積體電路製造有限公司(簡稱台積電)，資料收集自民國84年1月5日至民國84年2月16日，共30日。

日 期	台灣加權指數	台積電收盤價
840105	7051.49	155
840106	6919.31	154
840107	6915.4	154
840109	6869.08	151
840110	6756.88	150
840111	6777.24	149.5
840112	6609.5	148
840113	6582.4	146
840114	6511.3	140
840116	6536.65	137.5
840117	6515.79	137
840118	6623.52	138.5
840119	6598.02	145
840120	6372.01	141.5
840121	6431.99	146.5
840123	6295.04	140
840124	6167.79	139
840125	6299.62	143
840126	6307.85	141
840204	6328.38	143
840206	6417.28	148
840207	6531.82	147.5
840208	6526.74	146.5
840209	6543.42	147
840210	6554.78	148.5
840211	6565.24	150
840213	6498.21	149
840214	6504.59	148.5
840215	6576.25	152
840216	6646.55	156

請回答以下各問題:

(1) 試用圖表示每日指數變動率和台積電每日股價變動率之關係。(10%)

(2) 在此樣本期間，台積電股價變動率是否具有統計上的常態性和變動的波動性?(10%)

(3) 請導出指數和台積電股價兩者的統計直線性關係。(20%)

(4) 若以機率形式表示每日指數變動率和台積電股價變動率市場效率性的關係，請寫出。(10%)