

政經院

考試科目	經濟學	所別	4111、4182、4121、4122 4171、4191、4194、4211	考試時間	2月22日(六)第一節
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4212

Multiple Choice (1 point each)

Identify the letter of the choice that best completes the statement or answers the question.

- Which of the following is an advantage of tradable pollution permits?
 - Each firm is allowed to pollute exactly the same amount.
 - Revenue from the sale of permits is greater than revenue from a corrective tax.
 - The initial allocation of permits to firms does not affect the efficiency of the market.
 - Firms will engage in joint research efforts to reduce pollution.
- Alicia is a vegetarian, so she does not eat beef. That is, beef provides no additional utility to Alicia. She loves potatoes, however. If we illustrate Alicia's indifference curves by drawing beef on the horizontal axis and potatoes on the vertical axis, her indifference curves will
 - slope downward.
 - be vertical straight lines.
 - slope upward.
 - be horizontal straight lines.
- Which of the following demonstrates the law of demand?
 - After Jon got a raise at work, he bought more pretzels at \$1.50 per pretzel than he did before his raise.
 - Melissa buys fewer muffins at \$0.75 per muffin than at \$1 per muffin, other things equal.
 - Dave buys more donuts at \$0.25 per donut than at \$0.50 per donut, other things equal.
 - Kendra buys fewer Snickers at \$0.60 per Snickers after the price of Milky Ways falls to \$0.50 per Milky Way.
- Suppose researchers at the University of Wisconsin discover a new vitamin that increases the milk production of dairy cows. If the demand for milk is relatively inelastic, the discovery will
 - raise both price and total revenues.
 - lower both price and total revenues.
 - raise price and lower total revenues.
 - lower price and raise total revenues.

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註 試題隨卷繳交

政學院

考試科目	經濟學	所別	411.4182.4121.4122 4171.4191.4194.4211 4212	考試時間	2月22日(六)第一節
<p>5. When a tax is levied on buyers of tea,</p> <p>A. buyers of tea and sellers of tea both are made worse off.</p> <p>B. buyers of tea are made worse off, and the well-being of sellers is unaffected.</p> <p>C. buyers of tea are made worse off, and sellers of tea are made better off.</p> <p>D. the well-being of both buyers of tea and sellers of tea is unaffected.</p> <p>6. When a country allows trade and becomes an exporter of a good</p> <p>A. consumer surplus and producers surplus will increase.</p> <p>B. consumer surplus and producer surplus will decrease.</p> <p>C. consumer surplus will increase and producer surplus will increase.</p> <p>D. consumer surplus will decrease and producer surplus will increase.</p> <p>7. When a perfectly competitive firm makes a decision to shut down, it is most likely that</p> <p>A. marginal cost is above average variable cost.</p> <p>B. price is below the minimum of average variable cost.</p> <p>C. fixed costs exceed variable costs.</p> <p>D. average fixed costs are rising.</p> <p>8. Price discrimination is a rational strategy for a profit-maximizing monopolist when</p> <p>A. there is no opportunity for arbitrage across market segmentations.</p> <p>B. there is an opportunity for arbitrage across market segmentations.</p> <p>C. consumers are unable to be segmented into identifiable markets.</p> <p>D. they want to increase the deadweight loss that results from profit-maximizing behavior.</p> <p>9. As a group, oligopolists would always be better off if they would act collectively</p> <p>A. as a single monopolist.</p> <p>B. as a single competitor.</p> <p>C. as if they were each seeking to maximize their own profit.</p> <p>D. in a manner that would prohibit collusive agreements.</p> <p>10. If firms in a monopolistically competitive industry are making profits,</p> <p>A. firms will likely be subject to regulation.</p> <p>B. barriers to entry will be strengthened.</p> <p>C. new firms will enter the market.</p> <p>D. some firms must exit the market.</p>					
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商學院

考試科目	經濟學	所別	4111.4182.4121.4122 4171.4191.4194.4211	考試時間	2月22日(六) 第一節
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11. A company uses 100 workers and 30 units of capital to produce 500 units of output. If this company increases its capital to 50 units and, as a result, its output increases by 300 units, the productivity of labor _____ to _____ units per worker.

- A. increases; 1
- B. increases; 3
- C. increases; 8
- D. decreases; 4

12. Official unemployment statistics:

- A. understate unemployment because individuals receiving unemployment compensation are counted as employed.
- B. understate unemployment because discouraged workers are not counted as unemployed.
- C. include cyclical and structural unemployment, but not frictional unemployment.
- D. overstate unemployment because workers who are involuntarily working part time are counted as being employed.

13. A car that is produced in 2004 is not sold until 2005. According to the definition of GDP, in which year's GDP should it be counted?

- A. 2004.
- B. 2004 real GDP; 2005 nominal GDP.
- C. both years.
- D. 2005.

Total Population	30,000
Working-Age Population	25,000
Employment	11,000
Unemployment	1,000

14. Consider the data in the table above for a simple economy. The unemployment rate for this simple economy equals:

- A. 4.0%.
- B. 9.1%.
- C. 8.3%.
- D. 3.3%.

商學院

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15. Which of the following could cause nominal GDP to decrease, but real GDP to increase?
- The price level rises and the quantity of final goods and services produced falls.
 - The price level rises and the quantity of final goods and services produced rises.
 - The price level falls and the quantity of final goods and services produced falls.
 - The price level falls and the quantity of final goods and services produced rises.
16. When a member of the nonbank public withdraws currency from her bank account,
- both the monetary base and bank reserves rise.
 - bank reserves fall, but the monetary base remains unchanged.
 - both the monetary base and bank reserves fall.
 - the monetary base falls, but bank reserves remain unchanged.
17. When economists state that money is neutral in the long run, they mean that in the long run,
- the price level is independent of the nominal money supply.
 - the level of output is independent of the nominal money supply.
 - changes in the money supply have the same impact on the rich as they do on the poor.
 - fluctuations in the money supply are equally likely to lead to recessions as to expansions.
18. An expansionary monetary policy that successfully counteracts a recession has the side effect of
- lower investment spending than if no action had been taken.
 - lower output than if no action had been taken.
 - a higher price level than if no action had been taken.
 - a larger government deficit than if no action had been taken.
19. The less interest-sensitive is money demand, the
- steeper is the IS curve.
 - flatter is the LM curve.
 - more effective is monetary policy relative to fiscal policy.
 - more effective is fiscal policy relative to monetary policy.
20. The quantity theory of inflation indicates that the inflation rate equals
- the growth rate of the money supply minus the growth rate of aggregate output.
 - the level of the money supply plus the level of aggregate output.
 - the growth rate of the money supply plus the growth rate of aggregate output.
 - the level of the money supply minus the level of aggregate output.

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註 試題隨卷繳交

商學院

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Problems and Short-essay Questions

Please answer the following questions IN SEQUENCE. All questions may be answered in either Chinese or English.

1. Suppose that a firm's fixed proportion production function is given by

$$q = \min(2k, 10l - 2).$$

The inputs are hired in perfectly competitive markets. The rental rates of capital (k) and labor (l) are v and w , respectively.

- (10 points) Calculate the firm's long-run total, average, and marginal cost functions.
- (10 points) Suppose that k is fixed at 9 in the short run. Calculate the firm's short-run total, average, and marginal cost functions.

2. (20 points) Consider the good x imported by the home country. To keep things simple, assume that x constitutes a homogeneous good and that the market for it is perfectly competitive. The demand for x at home is given by $Q_D = 200 - 4P$. The domestic market supply is given by $Q_S = 4P - 40$.

- Suppose that x can be imported at a fixed world price of \$20. Suppose that the home government imposes an import tariff of \$5 per unit of x . What is the total number of x imported from abroad?
- Suppose that, because of political-economy considerations, the home government sets its import tariff, t , in order to maximize:

$$\text{Consumer Surplus} + \text{Tariff Revenues} + A \times (\text{Producer Surplus}).$$

What is the value of A under which the home government would impose an import tariff of \$5?

3. Assume that firms care about their after-tax rate of return on investment projects. And, suppose the incumbent government has decided to raise taxes on corporations. Use the loanable funds model to explain the effect of the tax increase.

- (7 points) What effect will this have on the investment demand curve? Explain and graph the effect.
- (7 points) What effect will this have on national savings? Explain and graph the effect.
- (6 points) Consider both effects that you have described in parts a and b. What will happen to the real interest rate, national savings, and investment? Explain and graph the effect.

新學院

考試科目	經濟學	所別	4111. 4182. 4121. 4122 4171. 4191. 4194. 4211	考試時間	2 月 22 日 (六) 第一節
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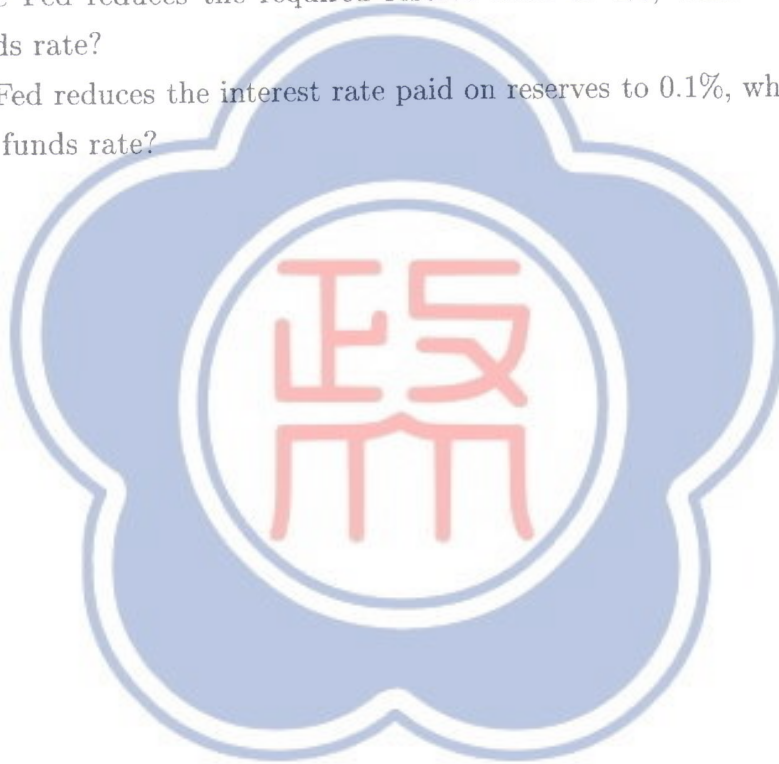
4212

4. Suppose currently the discount rate is 0.8%, the interest rate the Fed (the central bank) is paying for banks' excess reserves is 0.2%, the required reserve ratio is 5%, and the equilibrium federal funds rate is 0.2%.

a. (6 points) If the Fed reduces the discount rate to 0.6%, what will happen to the equilibrium federal funds rate?

b. (7 points) If the Fed reduces the required reserve ratio to 4%, what will happen to the equilibrium federal funds rate?

c. (7 points) If the Fed reduces the interest rate paid on reserves to 0.1%, what will happen to the equilibrium federal funds rate?



考試科目	統計學	所別	企業管理研究所/甲組 4211	考試時間	2月22日(六) 第三節
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1. 在台灣 A 型占 28%，B 型占 24%，O 型占 41%，AB 型占 7% 的比例。
- (a) 任選兩位臺灣民眾，這兩位民眾血型相同的機率為何？(5 分)
- (b) 任選四位臺灣民眾，這四位民眾血型不同的機率為何？(5 分)
- (c) 要至少選取 n 位臺灣民眾，才能使得這 n 位民眾中至少要有一位 AB 血型的機率要超過 25%？(請寫出數學表示式)(5 分)

2.

- (a) 何謂分層隨機抽樣法(Stratified Random Sampling)？
何謂群集抽樣法(Cluster Sampling)？兩者的差別？(5 分)
- (b) 何謂非抽樣誤差(non-sampling error)？在一般抽樣調查中，請敘述它可能發生的來源。(5 分)

3. 設 $X_1, X_2, \dots, X_{25} \stackrel{i.i.d.}{\sim} N(\mu, \sigma^2 = 64)$ ，若 $H_0: \mu = 5$ vs. $H_1: \mu = 7$ ，令 $\bar{X} = \frac{\sum_{i=1}^{25} X_i}{25}$ 。

- (a) 當顯著水準為 0.05，則拒絕域為何？型二錯誤的機率(β 風險)為何？(10 分)
- (b) 若樣本數不變時，希望將型二錯誤的機率(β 風險)降低至 0.1 時，則型一錯誤的機率(α 風險)會增為多少？(10 分)
- (c) 若希望型一錯誤的機率(α 風險)與型二錯誤的機率(β 風險)皆為 0.05，則樣本數又應增加為多少？(10 分)

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註 試題隨卷繳交

考試科目	統計學	所別	企業管理研究所/甲組 4211	考試時間	2月22日(六) 第三節
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4. 在數獨(Sudoku)遊戲中有不同程度之挑戰，某一教授試玩簡單級(Easy)跟中級(Moderate)版本，發現簡單級跟中級似乎沒有太多差異，於是決定做一實驗來檢定是否用在解中級版本數獨遊戲的時間，會比解簡單級版本數獨遊戲的時間來的長？這位教授決定用 30 天的時間，簡單級及中級版本各玩 15 次，每一天隨機選取簡單級或中級版本來挑戰，每天記錄其時間(分鐘)，下列表格中記錄簡單級及中級版本各 15 天的完成遊戲的時間。

簡單級	x	3	5	4	3	2	5	1	4	5	3	3	5	5	5	4
中級	y	4	1	3	2	4	1	3	4	2	2	2	4	3	4	5

- (a) 若用二獨立母體之 t 檢定，請寫出其虛無假設(Null Hypothesis)、對立假設(Alternative Hypothesis)、檢定統計量及其檢定結果？(10 分)
- (b) 若用無母數方法之 Wilcoxon Rank Sum Test 檢定，請寫出其虛無假設(Null Hypothesis)、對立假設(Alternative Hypothesis)、檢定統計量及其檢定結果？(10 分)
- (c) 針對上述(a)及(b)之檢定結果，請評論之。(10 分)
5. 欲探討銷售額與廣告費用之關係，以下為簡單線性迴歸模型結果。請寫出 b 、 c 、 g 、 h 、 j 的數值？(15 分)

迴歸結果				
R 的倍數	R 平方	調整的 R 平方	標準誤	觀察值個數
a	b	c	300	11

ANOVA					
	SS	自由度	MS	F	顯著值
迴歸	d	g	j	m	n
殘差	e	h	k		
總和	f	i			

	係數	標準誤	t 統計	P 值
截距	o	p	s	t
廣告費用	q	r	3	u

備註 試題隨卷繳交

考試科目	管理學	所別	企管系 4211、4212	考試時間	2 月 22 日(六) 第三節
<p>1. 日月光污水事件，是近年來台灣企業界對於環境污染的重大討論案例。請參照以下文章，並回答下列問題。</p> <p>a.) 試分析此事件發生的可能原因為何？(提示：可從對管理者進行道德或非道德行為的影響因素分析。)(25%)</p> <p>b.) 試從管理四大功能(規劃、組織、領導、控制)的角度說明，為了避免類似事件再發生，政府與企業分別可有哪些作法？(25%)</p>					
<p>講到治水預算就有氣，高雄市議員連袂痛批，市政府花了 6 年整治後勁溪，卻被日月光排出的強酸廢水，瞬間毀壞殆盡，水源污染、破壞環境，要求日月光還錢。</p> <p>高雄市府整治後勁溪，6 年花了 37 億，日月光一排放廢水，整治後果一夕全毀，但反觀日月光董事長張虔生，他的個人資產，2012 年 18 億美金，2013 年增加到 32.5 億美金，光是一年就淨賺 435 億台幣。</p> <p>一年賺四百多億，但現行污水法最高只開罰 60 萬，完全不痛不癢，因此市議員要求追討，37 億的後勁溪治水經費，以及中央 5 年來減免的 30 億租稅，共 67 億，要日月光加倍奉還。</p> <p>靠著高雄資源賺飽口袋，卻排廢水毒害高雄，苦的是無辜百姓，高層 10 號出面道歉止血，董事長張虔生卻神影不見人，嘴上認錯，其實卻把責任推得一乾二淨。</p> <p>日月光在高雄創業紮根，擠身全球大企業的行列，11 月剛創下單月營收新高紀錄，卻把強酸、重金屬廢毒水排到後勁溪，錢賺到他們的口袋，卻把毒害留給無辜百姓，現在把錯誤推給小小操作員，世界大廠該負責的態度在哪裡。(以下略。取自 2013 年 12 月網路報導文章。)</p>					
<p>2. 林小姐是某電腦公司市場開發部經理(需親自與客戶接觸並推銷產品)，今年三十歲，未婚。她思想敏銳，衝勁十足，三年前從國外獲得碩士學位歸來，可說是新一代女性之代表人物。</p> <p>若你是林小姐的主管，試設計至少三種適合林小姐的激勵方式，以增進其工作績效。請說明理由，並說明其各自相對應的激勵理論。(30%)</p>					
<p>3. 試說明 BCG 矩陣在管理公司總體策略(corporate strategy)的應用。(20%)</p>					
備註	試題隨卷繳交				

考試科目	微積分	所別	企管 4212	考試時間	2月22日(六) 第三節
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(All the calculations and justification process should be clear; otherwise, no point will be given.)

1. (20 points) AngelA brand company plans to promote a new product through two ways: on-line media and newspaper. Suppose the expected sales amount has the following relation with s times appearance in on-line media and n lines in newspaper:

$$f(s, n) = s^3 n$$

Further, the expense for each appearance in on-line media costs \$40,000 and each line spent in newspaper costs \$400. Suppose this company has a total 400,000 budget.

- (a) Assist AngelA to allocate spending in these two ways in order to maximize his sales amount. (10 points)
- (b) Can you mathematically confirm that the answer you get is the local maximum from the second order condition? Justify your answer. (10 points)
2. (10 points) An electricity company has 1 million continuous income stream with continuous compounding interest rate 5%. How much will it be worth 10 years from now?

3. (25 points) IGoStrong is an online drug retailer selling health supplements. Vitamin B is one of its popular products. Demand for such a product is very stable over time. Due to the limited shelf space, this retailer needs to determine an order amount of Vitamin B each time (Several orders can happen in one year) by considering three cost functions. Some notations are firstly defined.

D = annual demand of Vitamin B

s = setup cost each time

c = cost per bottle of Vitamin B

h = holding cost per bottle of Vitamin B kept on the shelf for one year.

q = order amount each time

The first cost function is the annual setup cost $S(q) = \frac{D}{q}s$. The second cost function is the

annual variable cost $V = cD$ and the third cost function is the annual holding cost

$H(q) = \frac{q}{2}hc$. Now, we acquire more detailed information that the annual demand is

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120,000 bottles per year, the setup cost each time is \$100, and the cost of each bottle is \$3, and the holding cost per bottle kept in the shelf for one year is \$0.6.

(a) Evaluate IGoStrong's optimal order amount each time to minimize the annual total cost. (10 points)

(b) Suppose the Vitamin B supplier considers to provide discount to IGoStrong if more order amount each time from IGoStrong appears. For order quantity between 0-5000 units, he will still keep the unit cost to be \$3. If order quantity each time is between 5,000-10,000, the unit cost drops to \$2.96. If the order quantity each time is over 10,000, the unit cost is \$2.92. Determine IGoStrong's optimal order amount each time and calculate the annual total cost. (15 points)

4. (25 points) Suppose two brand companies competing the sales of a product (company A is the leader and company B is the follower; e.g., decision is made firstly by company A and then by Company B). That is, follower B's order decision is based on leader A's order decision. The sales price is affected depending on the supply level (e.g., supply quantity) from both companies (q_A from Company A and q_B from Company B), and has the price functions $P_A = 6000 - q_A - q_B$ for Company A and $P_B = 6000 - q_A - q_B$ for company B. Standing from the leading company A's point of view, in this case, what is the supply quantity he should provide to maximize his own revenue?

5. (20 points) A brand company, AngelC, recently launches a new product. Whether a customer buying this new product depends on if he can accept the retail price. That is, if a potential buyer can accept the retail price up to \$30 (referred to as reservation price) and a brand company eventually determines the retail price to be $p = 25$, then this potential buyer will purchase it. Otherwise when the reservation price for another potential buyer is \$22, then he will not purchase it. Potential buyers' reservation price ξ is continuously distributed in \$20 to \$40 with a probability function $f(\xi) = 0.2 - 0.005\xi$, where $\xi \in (20, 40)$. Suppose the market size of potential buyers is 2000 people. That is, for example, the total number of potential buyers whose reservation is allocated in the range

between \$28 to \$32 is $2000 \int_{28}^{32} f(\xi) d\xi$.

(a) List the revenue if AngelC company tags a retail price $p = 30$. (10 points)

(b) What is the optimal retail price which can bring the maximum revenue to this brand company? Why? (10 points)

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