

考試科目	經濟學	系所別	商學院共同科	考試時間	2月10日(四) 第二節
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I. Multiple Choice (1 point each)

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

- Suppose the demand function for a good is expressed as $Q = 200 - 4p$. If the good currently sells for \$30, then the price elasticity of demand equals
 - 1.
 - 1.5.
 - 4.
 - 6.67.
- If Andy likes broccoli (B) but hates cabbage (C), which of the following might best represent his utility function for broccoli and cabbage?
 - $U = B + C$
 - $U = \min\{B, C\}$
 - $U = U/C$
 - $U = B^{0.5}C^{0.5}$
- As the price of a Giffen good falls, the consumer will
 - purchase more units.
 - purchase fewer units.
 - not change the amount purchased.
 - There is not enough information to answer this question.
- What will happen to the equilibrium price of new textbooks if more students attend college, paper becomes more expensive, textbook authors accept lower royalties, and more used textbooks are sold?
 - Price will rise.
 - Price will fall.
 - Price will stay exactly the same.
 - The price change will be ambiguous.
- With capital on the vertical axis and labor on the horizontal axis, vertical isoquants imply that
 - capital and labor are perfect substitutes.
 - capital and labor must be used together in certain proportion.
 - capital is not productive.
 - labor is not productive.

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6. In a monopolistically competitive market, the entry of new firms will lead to the demand curve of an incumbent firm become
- steeper.
 - flatter.
 - remain the same.
 - none of the above.
7. Which of the following statement is wrong for an oligopolistic market?
- A firm in the market has a supply curve.
 - The market outcomes could be like a monopoly.
 - When the number of firms in the market getting large, this market will approach to a perfectly competitive market.
 - The owners of firm consider the output effect and the price effect when making production decisions.
8. Which of the following statement is wrong for a perfectly competitive market?
- Some firms might earn profit in the long run.
 - For a firm, average revenue equals marginal revenue.
 - When the fixed cost is zero, a firm will leave the market when it earns negative profit.
 - The market long-run supply curve is always horizontal at the price.
9. Which of the following statement is wrong?
- In a perfectly competitive market which all firms have the same cost structure, the firms will produce at the efficient scale in the long run.
 - Under the average cost pricing, a monopoly will not create deadweight losses.
 - A competitive market might not as efficient as a monopoly.
 - Price discrimination might create deadweight losses.
10. Consider the production possibilities frontier of two goods. Which of the following statement is wrong?
- A slope of the PPF measures the opportunity cost between the two goods that producers face.
 - The production point will not lie to the right of the PPF.
 - The consumption point will not lie to the right of the PPF.
 - The production point and the consumption point could be different points.

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11. After a certain nation changed its policy from one that banned international trade in wheat to one that allowed international trade in wheat, the nation began importing wheat. As a result, total surplus in the wheat market increased by \$10 million. Which of the following changes could have occurred as well?

- A. The price of wheat in that nation increased with the adoption of the new policy.
- B. The domestic quantity of wheat supplied increased with the adoption of the new policy.
- C. Consumer surplus in the wheat market increased by \$7 million and producer surplus in the wheat market increased by \$3 million.
- D. Consumer surplus in the wheat market increased by \$15 million and producer surplus in the wheat market decreased by \$5 million.

12. Which of the following events would be consistent with purchasing-power parity?

- A. The price level in the United States rises more rapidly than that in Ireland and the real exchange rate defined as Irish goods per unit of U.S. goods stays the same.
- B. The money supply in the United States rises more rapidly than in Egypt and the nominal exchange rate defined as Egyptian pounds per dollar falls.
- C. Earl, a worldwide traveler, looks at exchange rates and worldwide breakfast prices one morning and finds that whatever country he decides to go to he can convert \$15 into enough local currency to buy the same breakfast.
- D. All of the above are correct.

13. According to classical macroeconomic theory, in the long run

- A. monetary growth affects both real and nominal variables.
- B. the only real variable affected by monetary growth is the unemployment rate.
- C. a number of factors that affect unemployment are influenced by monetary growth.
- D. monetary growth affects nominal but not real variables.

14. Jennifer took out a fixed-interest-rate loan when the CPI was 100. She expected the CPI to increase to 103 but it actually increased to 105. The real interest rate she paid is

- A. higher than she had expected, and the real value of the loan is higher than she had expected.
- B. higher than she had expected, and the real value of the loan is lower than she had expected.
- C. lower than she had expected, and the real value of the loan is higher than she had expected.
- D. lower than she had expected, and the real value of the loan is lower than she had expected.

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<p>15. There is a temporary adverse supply shock. Given the effects of this shock, if the central bank chooses to return unemployment closer to its previous rate it would</p> <ul style="list-style-type: none">A. raise the rate at which it increases the money supply. In the long run this will shift the short-run Phillips curve right.B. raise the rate at which it increases the money supply. In the long run this will shift the short-run Phillips curve left.C. reduce the rate at which it increases the money supply. In the long run this will shift the short-run Phillips curve right.D. reduce the rate at which it increases the money supply. In the long run this will shift the short-run Phillips curve left. <p>16. Which one of the following will increase the supply of money in the economy, everything else held constant?</p> <ul style="list-style-type: none">A. If the general public in the economy decides to hold more currency in the pockets.B. If the banking system decides to reduce the holding of excess reserves.C. The central bank sells bonds to the general public.D. The central bank sells its foreign currency reserves. <p>17. Which one of the following is not considered to be “conventional monetary policy tool”?</p> <ul style="list-style-type: none">A. Open market operation.B. Reserve requirement ratio.C. Discount rate and lending.D. Large scale asset purchases. <p>18. In the December 2021 statement, the FOMC “decided to keep the target range for the federal funds rate at 0 to 1/4 percent.” What is the federal funds rate?</p> <ul style="list-style-type: none">A. The interest rate anyone needs to pay to borrow money from the government.B. The interest rate banks receive by depositing money with the central bank.C. The interest rate banks pay to borrow money from the central bank.D. The interest rate banks pay to borrow money from other banks. <p>19. Since 2014, the ECB has adopted a negative interest rate policy. What is the rate that is negative?</p> <ul style="list-style-type: none">A. The interest rate the ECB pays to banks for depositing money with the ECB.B. The interest rate that the ECB lends to banks.					

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- C. The interest rate that the banks lend and borrow from other banks.
D. The rate of Eurodollar.

20. Everything else held constant, which of the following does not cause aggregate demand to increase?

- A. An increase in consumer spending.
B. An increase in investment spending.
C. An increase in taxes.
D. An increase in exports.

II. 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 the inverse demand curve for paper is $p = 150 - Q$. Paper is produced with a constant marginal cost of 10. For simplicity, assume that there are no fixed costs. Producing paper creates pollution. Each unit of production generates an external cost of 80 to the residents who live near the paper mill(s).

A. (7 points) What are the equilibrium price, quantity and the associated deadweight loss if paper is produced by perfectly competitive firms?

B. (7 points) What are the equilibrium price, quantity and the associated deadweight loss if paper is produced by a monopoly?

C. (6 points) Suppose the residents can costlessly negotiate with the monopoly. What is the equilibrium quantity of paper produced? What is the minimum monetary transfer from the residents to the monopoly that can achieve the social optimum?

2. Assume Taiwan is a small country and imports pork under free trade. The demand and supply are all linear. The consumers of Taiwan consume 1 million kilograms of pork per year. 400,000 of those are produced domestically and 600,000 are imported.

A. (10 points) Assume due to some reasons, the international price of pork falls by 100 dollars per kilogram. The consumers now consume 1.2 million kilograms of pork per year. 1 million of them are imported. Please calculate the welfare gain and the change of the producer surplus of the economy of Taiwan.

B. (10 points) If the government sets up a quota that only allows 400,000 kilograms of pork to be imported. After this policy, the price of pork in Taiwan rises by 150 dollars. Please calculate the deadweight loss for this policy.

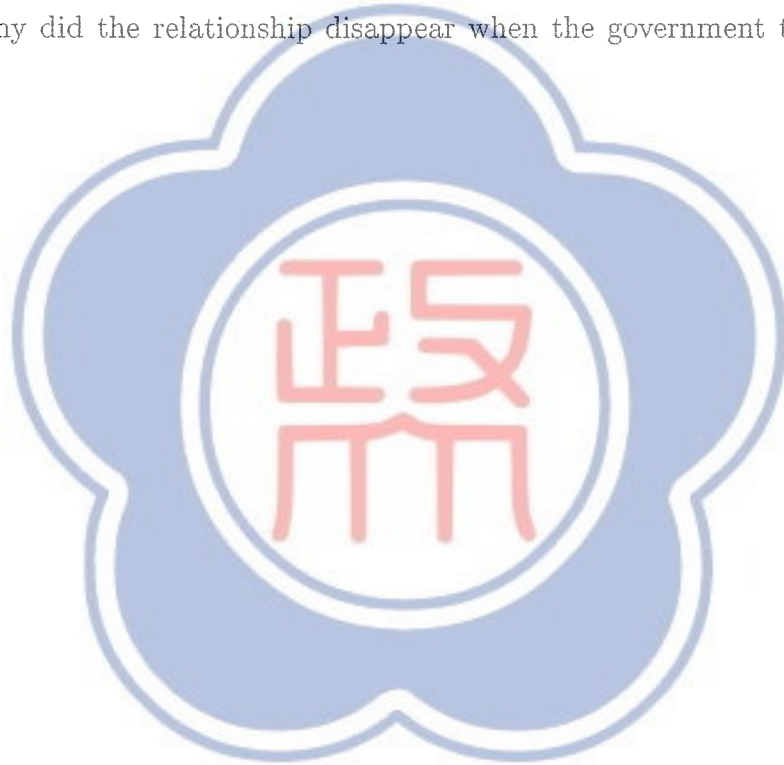
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3. Suppose Taiwan makes a decision to tax the import of agricultural products from abroad, but it does not decrease taxes or increase any other government spending to offset this tax revenues.

Using diagrams and words, show and explain what happens to

- A. (12 points) national saving, domestic investment, net capital outflow and the interest rate;
- B. (4 points) the exchange rate; and
- C. (4 points) the amount of exports, imports and trade balance.

4. (20 points) Please explain, in words, why did the relationship of the Phillips curve exist in the past, and then why did the relationship disappear when the government tried to use it to boost the economy?



備註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。

考試科目	微積分	系所別	科管智財所科管組	考試時間	2 月 10 日 (四) 第二節
以下各題，每大題十分；請依序回答，並寫明計算的程序。					
<p>1. 某一廠牌藍芽耳機的平均壽命為 3 年，其合理的故障機率之指數隨機變數模型為 $p(x) = \frac{1}{3}e^{-x/3}$，其中 $0 \leq x < \infty$，x 以年為單位，請計算該廠牌藍芽耳機最終故障的機率是多少？請計算該廠牌藍芽耳機在 9 年內會故障的機率是多少？</p> <p>2. $y = \int_1^x \sqrt{u^{3/2} - 1} du$，$1 \leq x \leq 16$，試求此函數圖形之長度。</p> <p>3. 某一假訊息於社群平台同時向 300 位用戶發送，在 t 小時之後，該訊息觸及到的用戶數為 $f(t) = \frac{3000}{1 + Ae^{-kt}}$，若 2 小時後有 600 位用戶收到訊息，那麼 4 小時後會有多少用戶收到這訊息？在訊息發送後 4 小時的傳播有多快（每小時有多少用戶收到）？</p> <p>4. T 工廠的生產函數為 $Q(x, y) = 6x^{1/3}y^{2/3}$，其中投入 x 千元在人力、y 千元在設備，如果 T 工廠可投入的人力與設備的資金共 150,000 元，該如何分配這筆資金在人力和設備上，才能獲取最大的產量？若 T 工廠的資金增加至 151,000 元，則最大產量的變化為何？</p> <p>5. $\lim_{x \rightarrow 0} \frac{1 - \sqrt{1+x^2} \cos x}{x^4}$，試估算極限值。</p> <p>6. $\int_1^2 \int_x^3 \int_0^y \frac{y}{y+z} dz dy dx$，求此積分值。</p> <p>7. 某巧克力廠商銷售 A 和 B 兩種具競爭性有機認證的巧克力，這兩種認證的取得價格皆為每包 2 元，若 A 認證的巧克力每包賣 x 元，B 認證的巧克力每包賣 y 元，經廠商估計，A 認證的巧克力每天會賣出 $40 - 50x + 40y$ 包，而 B 認證的巧克力每天會賣出 $20 + 60x - 70y$ 包，請問該廠商應該如何定價，才能得到最大的利潤？</p> <p>8. 試解微分方程式 $\frac{dy}{dx} = \frac{y}{x+y^3}$。</p> <p>9. 試求 $x = y^2$ 和 $x = \frac{3}{4}y^2 + 1$ 所包圍的面積。</p> <p>10. 若 $x^3z^2 + yz^3 = \cos xz$，試求 $\frac{\partial z}{\partial x}$ 和 $\frac{\partial z}{\partial y}$。</p>					
備	註	<p>一、作答於試題上者，不予計分。</p> <p>二、試題請隨卷繳交。</p>			

考 試 科 目	管理個案分析	系 所 別	科管智財所 科技管理組 一般生	考 試 時 間	2 月 10 日(四) 第 2 節
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● 個案：

2010 年，台灣高鐵與全家便利商店透過 Fami Port 機台合作，推出全台灣首張由便利商店代售的鐵路車票。2012 年五月天「諾亞方舟」航空母艦版演唱會門票於全台 7-ELEVEN 的 ibon 系統開賣，15 萬張門票短短不到 1 小時便銷售一空，相當於平均每分鐘就賣出 2500 張門票。曾幾何時，我們為了買門票、報稅、繳費，得花大半的時間通勤、排隊，然而直至今日，不管是演唱會售票、叫計程車、報稅，或甚至是新冠肺炎期間的口罩預購，這些需求只要走進便利商店，動動手指透過一台「多媒體事務機 (Multiple Media Kiosk, 簡稱 MMK)」便能完成！國立高雄科技大學行銷與流通管理系教授吳師豪、7-ELEVEN 前總經理徐重仁說起台灣超商 MMK 與高鐵的售票合作，更先後驕傲地表示，這是日本超商和新幹線也還沒辦法做到的整合服務！將資訊、物流、金流，串成一系列的流暢服務，你所要做的只是點擊面板，各種服務應有盡有，儼然成為便利商店的「店中店」。然而，這套 MMK 系統服務雖然在國內外便利商店早已看似發展完善，但其實早期在日本剛推出時卻是一敗塗地，以日本便利商店 LAWSON 1997 年與 IBM 合作開發的第一代 Loppi 更是徹底的失敗案例，不僅建置成本高昂、來客使用效率低、複雜的功能介面、螢幕緩慢的顯示速度及頻頻當機，都讓消費者抓狂，最終商業模式養不活系統，只好全面回收改版。當時日本的失敗經驗，更讓台灣便利商店業者嘗試跨足 MMK 的初期，更加小心謹慎。2004 年，萊爾富領先同業推出第一台 MMK 機「Life-ET」，雖然功能陽春，只有銀行紅利點數兌換商品、手機圖鈴下載、捐款三項服務，但當時不僅超商同業無人導入，國內也沒有這樣的設備。萊爾富資訊總處資訊長葉馥蘭回憶，所有服務的加入都要依賴資訊團隊自己建置。隨後，2005 年 OK 超商的「OK-go」、2006 年 7-ELEVEN 的「ibon」與 2007 年全家便利商店的「FamiPort」也陸續導入，可見各大業者早已看到了 MMK 帶來的生活服務商機，但要支應系統的成本相當可觀，以 7-ELEVEN 來說，不僅甫推出「ibon」的前 6 年便燒光 10 億元外，為維持系統營運每年更要花上 1 億元。當時擔任商品部部長的統一超商總經理黃瑞典便分享，早年 7-ELEVEN 要推出 ibon 前，其實內部主管多數不看好，因為日本超商最初推出的 MMK 功能主要是供消費者作為查詢資訊用，雖然後來漸漸普及但使用率仍不高。為了拓增使用層面，他發想將 ibon 與金流結合，並拓展代收與售票服務，果不其然在建置 5 年後，ibon 開始回本。如今，列印、售票、報稅、叫車等生活服務都能一機搞定，讓人對便利商店更加依賴。對便利商店業者而言，MMK 的導入主要帶來的好處有三。其一，便是得以在不花費過多空間、不消耗門市人力下拓展服務、增加「坪效」。其二，透過 MMK 不同服務的導入，創造自身服務的差異化。其三，若能強化 MMK「自我服務科技」服務流程的順暢條件，讓使用更具效率與品質，也有助於加深顧客好感度及忠誠度。佔地不到一坪的空間，一台小小的 MMK 機台不僅在超商有限的坪數外，創造另外一個虛擬空間、提供更多商品，也讓便利商店的服務得以更加簡便。直至 2015 年，光是 7-ELEVEN 的 ibon 單年的總交易筆數便突破 1.7 億次，等於平均每人每年至少使用 7.39 次。而發展至今 MMK 系統也從訂機票，一路拓展其業務，包含電信申辦、廣告刊登，或許未來更多意想不到的服務也都將在這間便利商店的「店中店」發生！

(摘取自：食力 2021/12/29—最小坪效店中店！便利商店用一台機器輕鬆搞定你的生活大小事！採訪＝林玉婷、蔡幸儒、黃欣培、黃敬翔，撰文＝蔡幸儒)

考 試 科 目	管理個案分析	系 所 別	科管智財所 科技管理組 一般生	考 試 時 間	2月10日(四)第2節
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● 問題：每題佔(20%)

- 1 在便利商店的產業競爭中，你認為最重要科技、知識與能力是什麼？
- 2 MMK 系統是便利商店連鎖體系向供應商訂製的，便利商店並不掌握製造 MMK 的科技，那麼各家便利商店在 MMK 上的競爭重點是什麼？要如何創新致勝呢？
- 3 在上述個案中，你認為會有哪些科技管理的議題？
- 4 在上述個案中，你認為會有哪些智慧財產權的議題？
- 5 政治大學商學院有哪些科技？知識？商學院產生過哪些智慧財產權呢？你為何要來這裡學習科技管理與智慧財產權呢？



備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。