

考 試 科 目	經濟學	所 別	商學院共同科	考 試 時 間	2 月 26 日 (日) 第一節
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Multiple Choice (1% each, 20% in total)

1. The market structure of an industry where firms have to invest a fixed cost before producing goods cannot be perfect competitive because
 - (a) the average cost decreases as production level decreases.
 - (b) the average cost is almost always higher than the marginal cost.
 - (c) the goods each firm produced are not perfectly substitute.
 - (d) firms always earn positive profit.

2. Suppose in a country, there is one firm in an industry. Suppose also there is infinite number of firms producing the same good in the rest of world. What is the possible impact on welfare when the country opening up to trade
 - (a) There will be no deadweight loss in the country.
 - (b) The deadweight loss still exists but smaller under trade.
 - (c) The deadweight loss is larger under trade.
 - (d) The producer surplus is larger under trade.

3. Suppose there are two countries. In the same industry, each country has only one producer. Producers produce the same good. Two producers have the same cost function and face the same demand function. Suppose there is international trade between two countries and producers choose output to maximize profit. There is also no collusion between firms.
 - (a) Compared with the scenario when there is no trade, the price charged by a firm is lower.
 - (b) Compared with the scenario when there is no trade, the production level of each firm is larger.
 - (c) Compared with the scenario when there is no trade, the deadweight loss is larger.
 - (d) Compared with the scenario when there is no trade, the profit of each firm increases.

4. In the industry with monopolistic competition,
 - (a) the price charged by a firm is larger than the average cost.
 - (b) the price charged by a firm is lower than the average cost.
 - (c) the number of producers increases as the aggregate demand increases.
 - (d) the number of producers decreases as the aggregate demand increases.

5. In the oligopoly economy with two identical producers producing the same product, when two producers collaborate to maximize aggregate profit
 - (a) The aggregate production level is higher than that when there is only one producer.

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- (b) The aggregate production level is lower than that when there is only one producer.
 (c) The aggregate production level is the same as that when there is only one producer.
 (d) The price is lower than that when there is only one producer.
6. Ryan has an income of \$3,000. When the price of good A is \$50 and the price of good B is \$30, he consumes 30 units of good A and 50 units of good B. After the price of good B decreases to \$15, he consumes 30 units of good A and 100 units of good B. We can use the information provided to conclude that
- (a) good A is a normal good.
 (b) good A is a normal good, and good B is an inferior good.
 (c) good A is an inferior good, and good B is a normal good.
 (d) both goods A and B are normal goods.
7. Two drivers -Tom and Jerry- each drive up to a gas station. Before looking at the price, each places an order. Tom says, "I'd like 10 gallons of gas." Jerry says, "I'd like \$10 worth of gas." What is each driver's price elasticity of demand?
- (a) 0, 1.
 (b) 1, 0
 (c) 0, infinity.
 (d) 1, infinity.
8. Suppose buyers of computers and printers regard those two goods as complements. Then an increase in the price of computers will cause
- (a) a decrease in the supply of printers and a decrease in the quantity demanded of printers.
 (b) a decrease in the demand for printers and a decrease in the quantity supplied of printers.
 (c) a decrease in the equilibrium price of printers and an increase in the equilibrium quantity of printers.
 (d) an increase in the equilibrium price of printers and a decrease in the equilibrium quantity of printers.
9. In the market for widgets, the supply curve is the typical upward-sloping straight line, and the demand curve is the typical downward-sloping straight line. The equilibrium quantity in the market for widgets is 200 per month when there is no tax. Then a tax of \$5 per widget is imposed. As a result, the government is able to raise \$750 per month in tax revenue. We can conclude that the equilibrium quantity of widgets has fallen by
- (a) 25 per month.
 (b) 50 per month.
 (c) 75 per month.
 (d) 100 per month.

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10. The total cost to the firm of producing zero units of output is

- (a) zero in both the short run and the long run.
- (b) its fixed cost in both the short run and the long run.
- (c) its fixed cost in the short run and zero in the long run.
- (d) zero in the short run and its fixed cost in the long run.

11. As a result of an open market purchase, bank reserves

- (a) rise and interest rates fall.
- (b) and interest rates both fall.
- (c) and interest rates both rise.
- (d) fall and interest rates rise.

12. Theoretically, one can distinguish a demand-pull inflation from a cost-push inflation by comparing

- (a) how fast prices rise relative to wages.
- (b) when prices rise relative to wages.
- (c) the unemployment rate with its natural rate level.
- (d) government debt to real GDP.

13. If oil prices fall at the same time that the government increases its purchases, in the short run

- (a) aggregate output and the price level will both fall.
- (b) aggregate output will increase, but the price level may either increase or decrease.
- (c) aggregate output and the price level will both increase.
- (d) aggregate output will increase, but the price level will fall.

14. The less interest-sensitive is money demand, the _____.

- (a) flatter is the LM curve
- (b) more effective is monetary policy relative to fiscal policy
- (c) steeper is the IS curve
- (d) more effective is fiscal policy relative to monetary policy

15. If currency outstanding equals \$200 million, checkable deposits equal \$1 billion, reserves equal \$150 million, and the required reserve ratio is 0.10, the money multiplier equals

- (a) 3.14.
- (b) 3.43.
- (c) 0.86.

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- (d) 4.
16. The total sales of all firms in the economy for a year
- (a) equals GDP for the year.
 - (b) is larger than GDP for the year.
 - (c) is smaller than GDP for the year.
 - (d) Any of the above is possible.
17. The theory of purchasing-power parity implies that the demand curve for foreign-currency exchange is
- (a) downward sloping.
 - (b) upward sloping.
 - (c) horizontal.
 - (d) vertical.
18. When a country allows trade and becomes an exporter of a good, which of the following is not a consequence?
- (a) The price paid by domestic consumers of the good increases.
 - (b) The price received by domestic producers of the good increases.
 - (c) The losses of domestic consumers of the good exceed the gains of domestic producers of the good.
 - (d) The gains of domestic producers of the good exceed the losses of domestic consumers of the good.
19. Suppose that the adult population is 4 million, the number of unemployed is 0.25 million, and the labor-force participation rate is 75%. What is the unemployment rate?
- (a) 6.25%.
 - (b) 8.3%.
 - (c) 9.1%.
 - (d) 18.75%.
20. If a \$1,000 increase in income leads to a \$750 increase in consumption expenditures, then the marginal propensity to consume is
- (a) 0.75 and the multiplier is 1 1/3.
 - (b) 0.75 and the multiplier is 4.
 - (c) 0.25 and the multiplier is 1 1/3.
 - (d) 0.25 and the multiplier is 4.

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Problem Solving (80%)

1. In a monopolistic competitive economy, each producer faces the following demand function

$$Q = \frac{1}{n} - P,$$

where Q is the production level, n is the number of producer and P is the price charged by a firm. Suppose each producer has the following cost function

$$TC = 1 + Q,$$

where TC is the total cost. Solve the production level and price charged by a firm. Please also solve the number of producer at equilibrium (it need not to be an integer.) (20%)

2. There are four industrial firms in Happy Valley.

Firm	Initial Pollution Level	Cost of Reducing Pollution by 1 Unit
A	70 units	\$25
B	80 units	\$20
C	50 units	\$15
D	40 units	\$10

The government wants to reduce pollution to 160 units, so it gives each firm 40 tradable pollution permits.

- (a) Graph the demand and supply curves for tradable pollution permits. (4%)
- (b) Who sells permits and how many do they sell at market equilibrium? Who buys permits and how many do they buy? What is the total cost of pollution reduction in this situation? (11%)
- (c) How much higher would the costs of pollution reduction be if the permits could not be traded? (3%)
- (d) What size of a corrective tax would achieve the goal of reducing pollution to 160 units? (2%)

3. Economist Michael Woodford recently says: "If prices or wages are sticky, monetary policy affects real activity, and so the consequences of an increase in government purchases depend on the monetary policy response."

- (a) Please explain the first part of the above quote, why is that if prices or wages are sticky, monetary policy affects real activity? (10%)
- (b) Please explain the second part of the above quote, what does it mean by "the consequences of an increase in government purchase depend on the monetary policy response"? (10%)

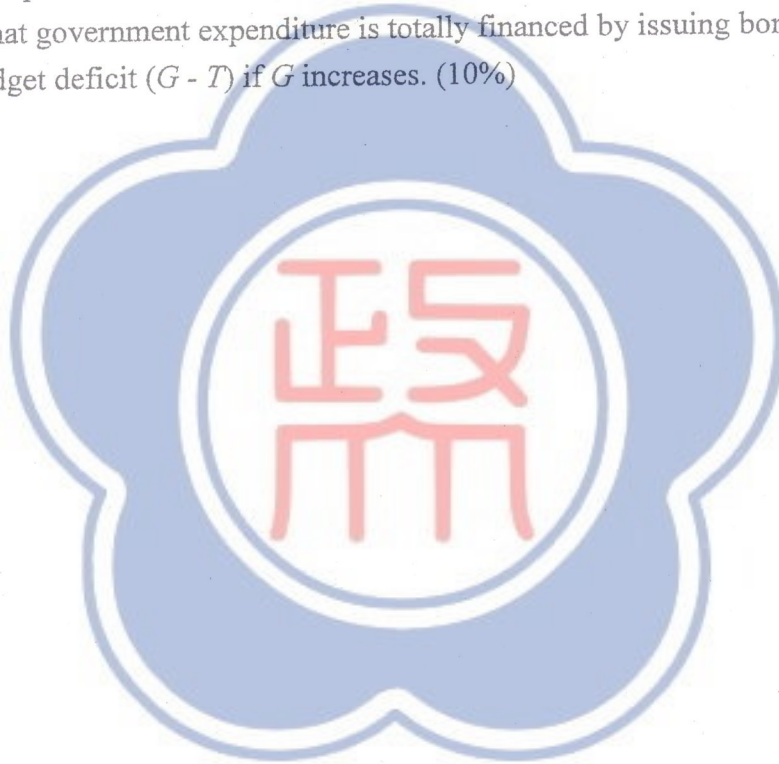
考試科目	經濟學	所別	商學院共同科	考試時間	7月26日(日) 第一節
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4. Consider a close economy described by:

$$Y = C + I + G$$

$$C = a + b(Y - T), 0 < b < 1, I = \bar{I}$$

- (a) Compute the output multiplier with respect to government consumption (dY/dG), under the assumption that G is totally financed by raising new lump-sum tax. (10%)
- (b) Now, assume a proportional taxation system, i.e. $T = t \cdot Y$, where t is the average income tax rate. Under the assumption that government expenditure is totally financed by issuing bonds, show what would happen to the budget deficit ($G - T$) if G increases. (10%)



考試科目	微積分	所別	智慧財產研究所 4201	考試時間	2月26日(日)第一節
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1. (20 分) Find area between $x = y^2$ and $2y = x - 3$.
2. (30 分) Let m, n be positive integers and $\log(\cdot)$ denotes the natural logarithm, compute

(a)

$$\lim_{\theta \rightarrow 0} \frac{\sin(n\theta)}{\sin(m\theta)}$$

(b)

$$\lim_{\theta \rightarrow 0} \frac{\log(1 + 5\theta)}{\theta}$$

(c)

$$\lim_{x \rightarrow \infty} x^{100} \cdot 2^{-0.01x}$$

3. (20 分) Compute

(a)

$$\int_1^{\infty} \frac{1}{\sqrt{x}} dx$$

(b)

$$\int_1^{\infty} \frac{1}{x\sqrt{x}} dx$$

4. (30 分) Let

$$f(t) = \frac{1}{\sqrt{2\pi}} \exp(-t^2/2)$$

and θ a real number. Compute

(a)

$$A = \int_0^{\infty} f(t) dt$$

(b)

$$g(\theta) = \int_{-\infty}^{\infty} \exp(\theta t) f(t) dt$$

(c)

$$\frac{d^2}{d\theta^2} g(\theta) |_{\theta=0}$$

考試科目	生命科學	所別	智慧財產所	考試時間	2 月 26 日星期日第一節
請回答下列問題 (每大題二十五分，共計四大題，每大題有五小題)					
1. Stability of food allergens to digestion in vitro.					
<p>An integral part of the safety assessment of genetically modified plants is consideration of possible human health effects, especially food allergy. Prospective testing for allergenicity of proteins obtained from sources with no prior history of causing allergy has been difficult because of the absence of valid methods and models. Food allergens may share physicochemical properties that distinguish them from nonallergens, properties that may be used as a tool to predict the inherent allergenicity of proteins newly introduced into the food supply by genetic engineering. One candidate property is stability to digestion. We have systematically evaluated the stability of food allergens that are active via the gastrointestinal tract in a simple model of gastric digestion, emphasizing the major allergens of plant-derived foods such as legumes (peanuts and soybean). Important food allergens were stable to digestion in the gastric model (simulated gastric fluid). For example, soybean beta-conglycinin was stable for 60 min. In contrast, nonallergenic food proteins, such as spinach ribulose bis-phosphate carboxylase/oxygenase, were digested in simulated gastric fluid within 15 sec. The data are consistent with the hypothesis that food allergens must exhibit sufficient gastric stability to reach the intestinal mucosa where absorption and sensitization (development of atopy 特異體質) can occur. Thus, the stability to digestion is a significant and valid parameter that distinguishes food allergens from nonallergens.</p>					
<p>(a)以遺傳工程改造的植物為何無法預期是否具有 allergenicity ?</p> <p>(b)一個蛋白質無法被我們的胃液消化，它可能具有哪些特性 ?</p> <p>(c)由上述文章中，我們可以得到一個結論：不能被我們胃液消化的食品一定具有 allergenicity. 請說明之。</p> <p>(d)food allergens 如何在腸道引起 atopy ?</p> <p>(e)你覺得白鳳豆容不容易消化？它有什麼成份可能對生体產生作用？假如你根據你的生化基礎否定它的效用，也請說明你的理由？</p>					
備	考	試卷隨卷繳交			

4201

考試科目	生命科學	所別	智慧財產所	考試時間	2 月 26 日星期日第一節
<p>2. Immunotherapeutic potential of antibodies produced in plants.</p> <p>Plants are capable of synthesizing and assembling virtually every kind of antibody molecule, ranging from the smallest antigen-binding domains and fragments, to full-length and even multimeric, antibodies. A number of plant hosts can be used, and because this a versatile expression system that can be scaled-up to agricultural proportions, a cheap and plentiful supply of antibodies could be made available. Immunotherapy is one of the many potential uses for bulk quantities of antibody. In particular, passive immunotherapy of mucosal surfaces may be possible, because functional secretory antibodies can be engineered in plants.</p> <p>a. 舉例說明人類在何種情況下需要使用抗体？</p> <p>b. 一般而言，取自人體的抗體會有何種問題產生？</p> <p>c. 由動物來的抗体又有何問題？</p> <p>d. 以植物產生抗体有何好處？其問題點又是什麼？</p> <p>e. 植物中含有我們需要的抗体，我們吃了它就可以得到所要的免疫力？</p>					
備	考	試卷隨卷繳交			

考試科目	生命科學	所別	智慧財產所	考試時間	2 月 26 日 星期日 第一節
3. Targeting glycosylation as a therapeutic approach.					
<p>N- and O-glycosylation of glycoproteins make up 1–2% of the human genome. In the case of N-linked GLYCANS, more than 30 enzymes, located in the cytosol, the ENDOPLASMIC RETICULUM (ER) and the GOLGI APPARATUS, are required to generate, attach and process the oligosaccharides. Many functions have been described for protein glycosylation, including promoting protein folding in the ER, stabilizing cell-surface glycoproteins, and providing recognition epitopes that activate the innate immune system. It is therefore not surprising that genetic mutations that decrease or eliminate the activity of GLYCOSYLTRANSFERASES and GLYCOSIDASES can lead to serious physiological disorders and can be lethal in animals as well as in humans.</p> <p>Increased understanding of the role of protein- and lipid-linked carbohydrates in a wide range of biological processes has led to interest in drugs that target the enzymes involved in glycosylation. But given the importance of carbohydrates in fundamental cellular processes such as protein folding, therapeutic strategies that modulate, rather than ablate, the activity of enzymes involved in glycosylation are likely to be a necessity. Two such approaches that use imino sugars to affect glycosylation enzymes now show considerable promise in the treatment of viral infections, such as hepatitis B, and glucosphingolipid storage disorders, such as Gaucher disease.</p>					
a. 何謂 protein glycosylation ?					
b. protein glycosylation 會提供細胞什麼功能 ?					
c. glycosylation inhibitors 將來臨床尚有何用途 ?					
d. glycosylation 的研究方法可能有那些 ?					
e. 真核細胞和原核細胞的 glycosylation 有差異嗎 ? 請說明之.					
備	考	試卷隨卷繳交			

4201

考試科目	生命科學	所別	智慧財產所	考試時間	2 月 26 日星期日第一節
<p>4. Resveratrol improves mitochondrial function and protects against metabolic disease by activating SIRT1 and PGC-1alpha.</p>					
<p>Diminished mitochondrial oxidative phosphorylation and aerobic capacity are associated with reduced longevity. We tested whether resveratrol (RSV), which is known to extend lifespan, impacts mitochondrial function and metabolic homeostasis. Treatment of mice with RSV significantly increased their aerobic capacity, as evidenced by their increased running time and consumption of oxygen in muscle fibers. RSV's effects were associated with an induction of genes for oxidative phosphorylation and mitochondrial biogenesis and were largely explained by an RSV-mediated decrease in PGC-1alpha acetylation and an increase in PGC-1alpha activity. This mechanism is consistent with RSV being a known activator of the protein deacetylase, SIRT1, and by the lack of effect of RSV in SIRT1(-/-) MEFs. Importantly, RSV treatment protected mice against diet-induced-obesity (肥胖) and insulin resistance. These pharmacological effects of RSV combined with the association of three Sirt1 SNPs and energy homeostasis in Finnish subjects implicates SIRT1 as a key regulator of energy and metabolic homeostasis.</p>					
<ol style="list-style-type: none"> 1. 請說明 mitochondrial oxidative phosphorylation and aerobic capacity. 2. Resveratrol 為紅葡萄酒的成分，請說明此一成分具有的特性與在心臟病預防的關聯性。 3. 請說明與 mitochondrial biogenesis 相關基因及其 pathway. 4. 請說明本文認為 Resveratrol 可以 against diet-induced-obesity (肥胖) and insulin resistance 的主要機轉。 5. 請說明你所知道老化的可能機轉。 					
備	考	試卷隨卷繳交			

考試科目	民法	所別	智慧財產研究所 4201	考試時間	2月26日(日) 第一節
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第一題：(25%)

法律行為違反法律規定時，其效力為何？

第二題：(25%)

說明債務不履行之類型、構成要件與法律效果。

第三題：(25%)

試從權利之內容說明權利之種類。專利權、商標權及著作權屬於何種權利？

第四題：(25%)

婚生子女、準婚生子女與非婚生子女如何區別？區別之實益何在？