

考 試 科 目	經濟學	系 所 別	商學院共同科	考 試 時 間	2 月 18 日 (一) 第一節
---------	-----	-------	--------	---------	------------------

一、Multiple Choice (1 point each)

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

- One would expect to observe diminishing marginal product of labor when
 - workers are discouraged about the lack of help from other workers.
 - crowded office space reduces the productivity of new workers.
 - union workers are told to reduce their work effort in preparation for a new round of collective bargaining talks.
 - only new workers are trained in using the most productive capital.
- Comparing marginal revenue to marginal cost
 - reveals the contribution of the last unit of production to total profit.
 - is helpful in making profit maximization production decisions.
 - always reveals whether a firm is making an economic profit.
 - tells a firm whether its fixed costs are too high.
 - (i) and (ii) only
 - (iii) only
 - (ii) and (iii) only
 - All of the above are correct.
- The monopolist's profit-maximizing quantity of output is determined by the intersection of which of the following two curves?
 - marginal cost and demand
 - average cost and demand
 - marginal cost and marginal revenue
 - average cost and marginal revenue
- One key difference between an oligopoly market and a competitive market is that
 - oligopolistic firms are interdependent while competitive firms are not.
 - oligopolistic firms sell completely unrelated products while competitive firms do not.
 - oligopolistic firms sell their product at a price equal to marginal cost while competitive firms do not.
 - oligopolistic firms are price takers while competitive firms are not.

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	經 濟 學	系 所 別	商學院共同科	考 試 時 間	2 月 18 日 (一) 第一節
<p>5. When advertising encourages customers to become more informed about all firms in the market,</p> <p>A. demand curves for specific brands in the market are likely to become less elastic.</p> <p>B. each firm is likely to have less market power.</p> <p>C. firms are able to foster stronger brand loyalty.</p> <p>D. the market power of individual firms is strengthened.</p> <p>6. David faces choices between Apple and Banana. He feels that having five apples and three bananas (5,3) is not different from having four apples and six bananas (4,6). Which following statement(s) is (are) possibly correct if Ethan's indifferent curves are downward-sloping?</p> <p>(i) Ethan feels (4, 4.8) is as good as (5, 3).</p> <p>(ii) Ethan feels (6, 2) is as good as (4, 6).</p> <p>A. (i)</p> <p>B. (ii)</p> <p>C. (i) and (ii)</p> <p>D. None of the above is correct.</p> <p>7. John and Ethan both work eight hours a day. In one day, John can make 4 cakes or 8 ice cream, whereas Ethan can make 2 cakes or 5 ice cream. Given this, which statement(s) is (are) correct?</p> <p>(i) Ethan has a lower opportunity cost in producing ice cream than John.</p> <p>(ii) John has an absolute advantage in producing both goods.</p> <p>(iii) It is not beneficial for John to trade with Ethan.</p> <p>A. (i) and (ii)</p> <p>B. (i) and (iii)</p> <p>C. (ii) and (iii)</p> <p>D. (i), (ii), and (iii)</p> <p>8. Which following statement(s) is (are) correct?</p> <p>(i) A Giffen good is always an inferior good.</p> <p>(ii) A Giffen good is a good that its income effect is larger than its substitution effect.</p> <p>A. (i)</p> <p>B. (ii)</p> <p>C. (i) and (ii)</p> <p>D. None of the above is correct.</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	經 濟 學	系 所 別	商學院共同科	考 試 時 間	2 月 18 日 (一) 第一節
---------	-------	-------	--------	---------	------------------

9. John, Ethan, and Mary decide to buy a bike together and share the ownership. Their willingness to pay for each choice is in the following table

	John	Ethan	Mary
Bike A	\$800	\$300	\$500
Bike B	\$700	\$450	\$500
Bike C	\$600	\$500	\$500
Bike D	\$500	\$550	\$500
Bike E	\$400	\$650	\$500

They will choose the bike that all three agree to buy. Which following statement(s) is(are) correct?

- (i) The bike will be a public good among them.
(ii) If three people share the cost and all bikes have the same price, \$1500, the choice that maximizes aggregate surplus will be chosen.

- A. (i)
B. (ii)
C. (i) and (ii)
D. None of the above is correct.

10. Suppose Country A proposes to impose a tax on a good. One report from an economist argues that this tax will increase producers' before-tax total revenue and make the producers bear relatively more tax burden than consumers. Which following statement is correct for the good?

- A. The price elasticity of demand is 1.8; the price elasticity of supply is 0.8.
B. The price elasticity of demand is 0.9; the price elasticity of supply is 0.3.
C. The price elasticity of demand is 0.6; the price elasticity of supply is 1.4.
D. There is not enough information to answer the question.

11. In a certain economy, when income is \$1000, consumer spending is \$800. The value of the multiplier for this economy is 2.5. It follows that, when income is \$1060, consumer spending is

- A. \$815.
B. \$836.
C. \$900.
D. \$950.

考 試 科 目	經濟學	系 所 別	商學院共同科	考 試 時 間	2 月 18 日 (一) 第一節
<p>12. Which of the following is not a reason that paying efficiency wages may increase a firm's profit?</p> <p>A. Efficiency wages increase worker health and therefore increase worker productivity.</p> <p>B. Efficiency wages decrease worker turnover and therefore decrease hiring and training costs.</p> <p>C. Efficiency wages decrease worker shirking and therefore increase worker productivity.</p> <p>D. Efficiency wages are below the equilibrium wage rate but still attract high quality workers.</p> <p>13. If the Federal Reserve accommodates an adverse supply shock,</p> <p>A. inflation expectations may rise which shifts the short-run Phillips curve shifts right.</p> <p>B. inflation expectations may rise which shifts the short-run Phillips curve shifts left.</p> <p>C. inflation expectations may fall which shifts the short-run Phillips curve shifts right.</p> <p>D. inflation expectations may fall which shifts the short-run Phillips curve shifts left.</p> <p>14. If a local bank decides to convert some of its U.S. Treasury securities into cash, which it will hold in its vault, what impact will this have on the bank's balance sheet?</p> <p>A. Reserves would increase, liabilities would stay the same, and owner's equity would decrease.</p> <p>B. Reserves would increase, liabilities would stay the same, and owner's equity would increase.</p> <p>C. Reserves would decrease, liabilities would decrease, and owner's equity would decrease.</p> <p>D. Reserves would decrease, liabilities would stay the same, and owner's equity would decrease.</p> <p>15. Matilda just graduated from college. In order to devote all her efforts to college, she didn't hold a job. She is going to tour around the country on her motorcycle for a month before she starts looking for work. Other things the same, the unemployment rate</p> <p>A. increases, and the labor-force participation rate decreases.</p> <p>B. and the labor-force participation rate both increase.</p> <p>C. increases, and the labor-force participation rate is unaffected.</p> <p>D. and the labor-force participation rate are both unaffected.</p> <p>16. In an IS-LM model, if the government adopts a loose monetary policy and a tight fiscal policy simultaneously,</p> <p>A. interest rate increases, while output stays the same.</p> <p>B. interest rate stays the same, while output decreases.</p> <p>C. interest rate change is uncertain, while output increases.</p> <p>D. interest rate decreases, while output changes is uncertain.</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	經濟學	系 所 別	商學院共同科	考 試 時 間	2 月 18 日 (一) 第一節
---------	-----	-------	--------	---------	------------------

17. In a small open economy, a loose fiscal policy coupled with an increase in import tariff will cause domestic currency to

- A. increase.
- B. decrease.
- C. remain the same.
- D. change in an uncertain direction.

18. Assuming, in a two-period model, that the nominal wage rate increases from \$10/hour to \$15/hour; the expected price level increases from 1 to 3; and the actual price level increases from 4 to 5, we can deduce that

- A. nominal wage rate decreases.
- B. expected real wage rate increases.
- C. actual real wage rate increases.
- D. All of the above are correct.

19. Suppose the objective function of a government is described by $W(u, \pi) = (u + 5\pi^2)$ where u is the unemployment rate, and π is the inflation rate, while the Phillips curve is described by $\pi = \pi^e - 2(u - u^*)$ where π^e is the expected inflation rate, and u^* is the natural rate of unemployment. Which of the following inflation rate is a credible promise that the government can make?

- A. 0%
- B. 2%
- C. 5%
- D. 10%

20. If the central bank announces a decrease in money supply while keeping the actual money supply unchanged, the rational expectations theory would predict

- A. both output and price remain unchanged.
- B. output increases, while price decreases.
- C. output decreases, while price increases.
- D. output remains unchanged, while price decreases.

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	經濟學	系 所 別	商學院共同科	考 試 時 間	2 月 18 日 (一) 第一節
---------	-----	-------	--------	---------	------------------

二、Problems and Short-essay Questions

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

1. Suppose there is a small country. It imports apples at the price of \$10 per bag. The demand curve is $D = 400 - 10P$. The supply curve is $S = 50 + 5P$. The country imposes a specific tariff so that the import is 50 bags. Answer the following questions.

- (5 points) Calculate the tariff imposed by the country.
- (5 points) Calculate the tariff revenue.
- (5 points) Calculate the consumption distortion loss.
- (5 points) Calculate the production distortion loss.

2. Suppose the demand curve of a specific kind of flower for Country A is $Q^D = 200 - P$, where Q^D is the quantity demanded and P is the price. The supply curve in the same market is $Q^S = 3P$, where Q^S is the quantity supplied.

A. (15 points) Suppose scientists find that the scent of this specific kind of flower can cure mental disorders. Hence, for each unit of the quantity demanded brings \$80 external benefit. Assume the world price P^W is \$60 and is not affected by Country A's policies. Considering this external benefit, should Country A export or import how many units of this good? Please draw a graph and label all relevant points. Also, please show your calculation.

B. (5 points) How can the government deal with the issue of the external benefit that is described above? Please clearly explain your answer.

3. In an imaginary economy, consumers buy only sandwiches and magazines. In 2016, the base year, a sandwich cost \$5 and a magazine cost \$4. The consumers bought 20 sandwiches and 25 magazines at these prices. In 2017, a sandwich cost \$6.

A. (8 points) If the consumer price index in 2017 was 125, then how much did a magazine cost in 2017?

B. (12 points) Suppose that consumers bought 30 sandwiches and 25 magazines in 2017. What was the growth rate of nominal GDP between 2016 and 2017? What was the growth rate of real GDP between 2016 and 2017? What was the GDP deflator in 2017?

備

註

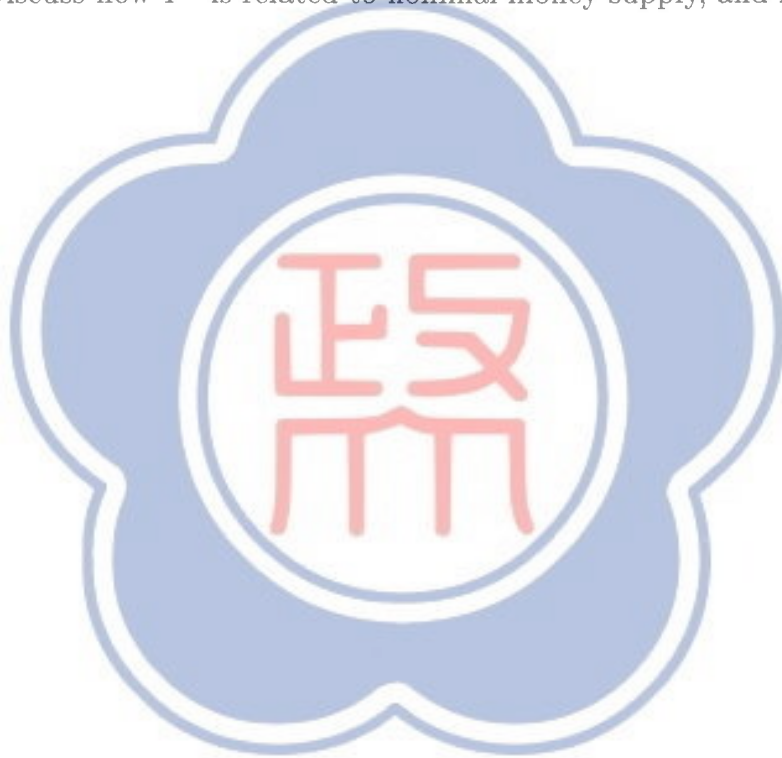
- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。

考 試 科 目	經濟學	系 所 別	商學院共同科	考 試 時 間	2 月 18 日 (一) 第一節
---------	-----	-------	--------	---------	------------------

4. Consider an economy with a consumption function $C = C_0 + c \cdot Y_d$, where Y_d represents disposable income; an investment function $I = I_0 - b \cdot r$, where r represents interest rate; tax revenue $T = T_0 + t \cdot Y$, where t represents tax rate; transfer payment TP ; a money demand function $L = k \cdot Y - h \cdot r$; a money supply function, $M = M_0/P$, where M_0 is the nominal money supply controlled by the central bank, and P represents the general price level.

A. (10 points) Derive the equilibrium output level Y^* when the goods market and the money market are in equilibrium simultaneously.

B. (10 points) Discuss how Y^* is related to nominal money supply, and how this relationship is affected by h .



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	科技管理與 智慧財產研究所	考 試 時 間	2 月 18 日(一) 第一節
---------	-----	-------	------------------	---------	-----------------

以下各題，每題十分；請依序回答，並寫明計算的程序。

1. 廠商推出新產品 t 天之後，每日營業收入為 $r(t) = 200t - 3t^2$ 。請問推出後第 30 天到 60 天期間，每日的平均營業收入是多少？
2. 公司新買的一批電腦，其硬碟與螢幕的預期壽命分別是 x 年與 y 年，兩者壽命的聯合機率函數為 $f(x, y) = 3e^{-x-3y}$ 。請問硬碟壽命至少維持 3 年、螢幕壽命至少維持 4 年的機率是多少？
3. 創投基金投資一家新創公司 500 萬元， t 年後回收 1000 萬元，以連續複利來計算，平均報酬率是 20%。請問 t 是多少？
4. 已知 $\ln(2) = 0.69315$ ，請以泰勒展開式估計對數 $\ln(2.01)$ 的數值到小數點以下第 5 位。
5. 咖啡 x 與奶茶 y 都是陳小姐所喜歡的飲料，其滿足程度可以用效用函數 $U(x, y) = x^{\frac{1}{2}}y^{\frac{1}{3}}$ 來表達。當她消費量是 $x=3, y=2$ 時，在滿足程度不變的情況下，請問她多喝一杯咖啡、要少喝幾杯奶茶？
6. 一家廠商的生產函數是 $Y(K, L) = 4K^{\frac{1}{2}}L^{\frac{1}{2}}$ ， Y =產出， K =資本，單位價格是 6 元；而 L =勞力，單位價格是 24 元。廠商希望以最少的成本來生產 32 單位的產出 Y 。請問，要用多少的資本與勞力？成本是多少？
7. 已知某獨佔廠商的商品所面臨的市場需求曲線是 $q = F(p) = 600 - 50p$ ，目前的價格 $p=4$ ，銷售量 $q=100$ 。請問廠商應不應該漲價？（或，漲價後收入會增加還是減少？）
8. 如果要製造一個底部是正方形的長方體，體積是 108000 立方公分。請問，如果要讓表面積最小，正方形尺寸及高度是多少？
9. $\frac{dy}{dx} = xe^{2x} + \frac{1}{\sqrt{x+1}}$ ， $y(0) = 3$ ，請問 $y = f(x) = ?$
10. $y = \sin(x)$ ，求 $x = [0, \pi]$ 時的曲線與 x 軸所圍的區域面積。

備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。