

考試科目	211B, 411B, 41213, 經濟學 414B, 41513, 41813	系所別	商學院共同科、 經濟學	考試時間	7月11日(三)第二節
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Multiple Choice (3 point each)

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

- Good news for farming can be bad news for farmers because the
 - supply curve for an individual farmer is usually perfectly elastic..
 - supply curve for an individual farmer is usually perfectly inelastic.
 - demand for basic foodstuffs is usually inelastic, meaning that factors that shift supply to the right decrease total revenues to sellers.
 - demand for basic foodstuffs is usually elastic, meaning that factors that shift supply to the right increase total revenues to sellers.
- Suppose that a tax is placed on books. If the buyers pay the majority of the tax, then we know that the
 - demand is more inelastic than the supply.
 - supply is more inelastic than the demand.
 - government has required that buyers remit the tax payments.
 - government has required that sellers remit the tax payments.
- Opponents of free trade often want the United States to prohibit the import of goods made in overseas factories that pay wages below the U.S. minimum wage. Prohibiting such goods is likely to
 - cause these factories to pay the U.S. minimum wage.
 - increase the rate of technological advance in poor countries so that they can afford to pay higher wages.
 - increase poverty in poor countries and benefit U.S. firms which compete with these imports.
 - harm U.S. firms which compete with these imports.
- The Tragedy of the Commons can be corrected by
 - conducting a cost-benefit analysis.
 - assigning property rights to individuals.
 - providing government subsidies for the resource.
 - making certain everyone in the economy has access to the resource.

備註

- 作答於試題上者，不予計分。
- 試題請隨卷繳交。

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5. Suppose that electricity producers create a negative externality equal to \$5 per unit. Further suppose that the government gives a \$5 per-unit subsidy to producers. What is the relationship between the equilibrium quantity and the socially optimal quantity of electricity to be produced?
- They are equal.
 - The equilibrium quantity is greater than the socially optimal quantity.
 - The equilibrium quantity is less than the socially optimal quantity.
 - There is not enough information to answer the question.
6. Suppose that a firm has only one variable input, labor, and firm output is zero when labor is zero. When the firm hires 5 workers the firm produces 26 units of output. Fixed costs of production are \$6 and the variable cost per unit of labor is \$10. The marginal product of the sixth unit of labor is 4. Given this information, what is the average variable cost of production when the firm hires 6 workers?
- \$0.5
 - \$1.0
 - \$2.0
 - \$2.2
7. A competitive market is in long-run equilibrium. If demand increases, we can be certain that price will
- rise in the short run. Some firms will enter the industry. Price will then rise to reach the new long-run equilibrium.
 - rise in the short run. Some firms will enter the industry. Price will then fall to reach the new long-run equilibrium.
 - fall in the short run. All, some, or no firms will shut down, and some of them will exit the industry. Price will then rise to reach the new long-run equilibrium.
 - not rise in the short run because firms will enter to maintain the price.
8. Which of the following is included in the calculation of GDP?
- The purchase of tutoring services from a tutor who holds citizenship outside the country but resides within the country.
 - The purchase of a new edition of a foreign textbook that was produced in a different nation.

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C. The purchase of ink and paper supplies by a textbook company for the production of new textbooks.

D. The purchase of a used textbook from a friend who took the same class last year.

9. In an imaginary economy, consumers buy only sandwiches and magazines. The fixed basket consists of 20 sandwiches and 30 magazines. In 2006, a sandwich cost \$4 and a magazine cost \$2. In 2007, a sandwich cost \$5. The base year is 2006. If the consumer price index in 2007 was 125, then how much did a magazine cost in 2007?

- A. \$0.83
- B. \$2.25
- C. \$2.50
- D. \$3.00

10. Kelly puts money in a savings account. One year later she has two percent more dollars and can buy three percent more goods. Kelly earned a real interest rate of

- A. two percent and prices fell one percent.
- B. two percent and prices rose one percent.
- C. three percent and prices rose one percent.
- D. three percent and prices fell one percent.

11. Which of the following is not a commonly-cited explanation for the dramatically increasing labor-force participation rates for women from 1950 to the present?

- A. availability of reliable birth control
- B. invention of household labor-saving devices such as dishwashers and microwave ovens
- C. men acquiring additional years of schooling before entering the labor force
- D. changing social attitudes about working mothers

12. During recessions, banks typically choose to hold more excess reserves relative to their deposits. This action

- A. increases the money multiplier and increases the money supply.
- B. decreases the money multiplier and decreases the money supply.
- C. does not change the money multiplier, but increases the money supply.
- D. does not change the money multiplier, but decreases the money supply.

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13. Under the assumptions of the Fisher effect and monetary neutrality, if the money supply growth rate rises, then

- A. both the nominal and the real interest rate rise.
- B. neither the nominal nor the real interest rate rise.
- C. the nominal interest rate rises, but the real interest rate does not.
- D. the real interest rate rises, but the nominal interest rate does not.

14. In 2002 it looked like the Argentinean government might default on its debt (which eventually it did). The open-economy macroeconomic model predicts that this should have

- A. raised Argentinean interest rates and caused the Argentinean currency to appreciate.
- B. raised Argentinean interest rates and caused the Argentinean currency to depreciate.
- C. lowered Argentinean interest rates and caused the Argentinean currency to appreciate.
- D. lowered Argentinean interest rates and caused the Argentinean currency to depreciate.

15. A movement to the left along a given short-run Phillips curve could be caused by

- A. a reduction in the natural rate of unemployment or expansionary monetary policy.
- B. expansionary monetary policy, but not a reduction in the natural rate of unemployment.
- C. either a reduction in the natural rate of unemployment or a contractionary monetary policy.
- D. contractionary monetary policy, but not a reduction in the natural rate of unemployment.

Problems

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

1. Tom buys only milk and cookies. When the price of milk goes up from \$5 per gallon to \$10 per gallon, he responds by consuming exactly the same amount of milk as before, while spending \$20 less on cookies.

A. (5 points) Does the fact that Tom's quantity of milk consumed is completely unresponsive to the price increase imply that milk is an inferior good? Explain your answer using the concepts of income and substitution effects.

B. (5 points) Are cookies a normal or an inferior good? Again, justify your answer using the concepts of income and substitution effects.

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2. Consider a monopolistically competitive market with N firms. The demand curve and total cost of firm i , $i \in \{1, 2, \dots, N\}$, are given by the following equations:

$$\text{Demand: } q_i = 1000/N - p_i \quad \text{and} \quad \text{Total Cost: } TC(q_i) = 50 + q_i^2.$$

Suppose currently, there are 10 firms in the market.

- (4 points) How many units does each firm produce?
- (4 points) What price does each firm charge?
- (4 points) How much profit does each firm make?
- (8 points) In the long run with free entry and exit, what is the equilibrium price and quantity in this market? How many firms are there in the market?

3. Consider an economy described by the following equations:

$$Y = C + I + G$$

$$C = 100 + 0.75 \cdot (Y - T)$$

$$I = 500 - 5000 \cdot r$$

$$G = 300$$

$$T = t \cdot Y$$

where Y represents the GDP, C is consumption, I is investment, G is government purchases, t is the tax rate, and r is the interest rate. If the economy were at full employment (that is, at its natural rate), GDP would be 2000.

- (10 points) Suppose the government sets the tax rate at 20 percent, so $t = 20\%$, what level of interest rate would achieve the natural rate of output?
- (8 points) Now suppose the central bank sets the interest rate at 4 percent, so $r = 4\%$. Solve for GDP. How does it compare to the natural rate of output?
- (7 points) Holding the interest rate at 4 percent, what change in government purchases would restore full employment?

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1. (20 pts) Find the following limits. Show your work.

(a) (5 pts) $\lim_{x \rightarrow \infty} \frac{\sin(x)}{x}$.

(b) (5 pts) $\lim_{h \rightarrow 0} \frac{(2+h)\cos(2+h) - 2\cos(2)}{h}$.

(c) (5 pts) $\lim_{x \rightarrow \infty} \frac{\int_1^x \ln(t) dt}{\int_1^x t \ln(t) dt}$.

(d) (5 pts) $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \ln\left(1 + \frac{2k}{n}\right)$.

2. (20 pts) Find the following integrals.

(a) (5 pts) $\int_0^{\pi} \sin(x) dx$.

(b) (5 pts) $\int_0^1 (2x+3)^{1/2} dx$.

(c) (5 pts) $\int_0^1 x \ln(x) dx$.

(d) (5 pts) $\int_D (2x+3y) d(x,y)$, where $D = \{(x,y) : |x| + |y| \leq 1\}$.

3. (20 pts) Determine whether each of the following series converges. Justify your answers.

(a) (5 pts) $\sum_{n=1}^{\infty} \left(1 + \frac{1}{n}\right)^n$.

(b) (5 pts) $\sum_{n=1}^{\infty} \frac{\sin(n+1)}{n^2}$.

(c) (5 pts) $\sum_{n=1}^{\infty} \frac{\ln(n)}{n^{1.2}}$.

(d) (5 pts) $\sum_{n=1}^{\infty} \frac{(n!)^2}{(2n)!}$.

4. (20 pts) Let $f(x) = \sin(x)/x$ for $x \neq 0$ and $g(x) = x \cos(x) - \sin(x)$ for $x \in (-\infty, \infty)$.

(a) (5 pts) Is it possible to define $f(0)$ so that f is differentiable at 0? Justify your answer.

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- (b) (5 pts) Suppose that I is an open interval and $I \subset (0, \infty)$. Show that if $g(x) > 0$ for $x \in I$, then f is increasing on I .
- (c) (5 pts) Show that g is decreasing on $(0, \pi/2)$.
- (d) (5 pts) Suppose that $f(0)$ is defined so that f is continuous at 0. Does f have a relative maximum at 0? Justify your answer.

5. (20 pts) Let $D = \{(x, y) : 1 \leq x^2 + y^2 \leq 2, x \geq 0 \text{ and } y \geq 0\}$ and

$$f(x, y) = \begin{cases} xy/(x^2 + y^2), & \text{if } x^2 + y^2 > 0; \\ 0, & \text{otherwise.} \end{cases}$$

- (a) (5 pts) Determine whether f is continuous at $(0, 1)$. Justify your answer.
- (b) (5 pts) Find $f_y(0, 0)$.
- (c) (5 pts) Find $\int_D f(x, y) d(x, y)$.
- (d) (5 pts) Does f have a relative minimum at $(0, 0)$? Justify your answer.

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