

國立清華大學 103 學年度碩士班考試入學試題

系所班組別：計量財務金融學系 甲組、乙組

考試科目（代碼）：經濟學 (4502) (4602)

共 20 題，每題 5 分

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\*請在【答案卷、卡】作答

1. Tom's utility function is  $U(x, y) = xy^2$ , with associated marginal utility function  $MU_x = y^2$  and  $MU_y = 2xy$ . He has income  $I = 120$  and faces prices  $P_x = 4$  and  $P_y = 1$ . Determine Tom's optimal consumption basket given these prices and his income.

[A]  $(x, y) = (10, 80)$

[B]  $(x, y) = (12, 72)$

[C]  $(x, y) = (20, 40)$

[D]  $(x, y) = (24, 24)$

[E] None of the above.

2. Consider a production function whose equation is given by the formula:

$$Q = \left[ aL^{\frac{\sigma}{\sigma+1}} + bK^{\frac{\sigma}{\sigma+1}} \right]^{\frac{\sigma+1}{\sigma}}$$

The elasticity of substitution is:

[A]  $\sigma$ .

[B]  $\sigma + 1$ .

[C]  $\frac{1}{\sigma}$ .

[D]  $\frac{1}{\sigma+1}$ .

[E] None of the above.

3. The production function of a firm is  $Q = 100K^{0.5}L^{0.5}$ . Suppose the prices of labor and capital are  $w$  and  $r$ , respectively. The long-run total cost curve of the firm is:

[A]  $\frac{\sqrt{wr}}{50}Q$

[B]  $\frac{\sqrt{wr}}{25}Q$

[C]  $\frac{1}{50}\sqrt{\frac{w}{r}}Q$

[D]  $\frac{1}{25}\sqrt{\frac{w}{r}}Q$

[E] None of the above.

4. Which of the following is not a characteristic of perfect competitive markets?

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- [A] The industry consists of many buyers and sellers. Each buyer's purchases are so small that they have imperceptible effect on market price.
- [B] Consumers perceive the products to be identical no matter who produces them.
- [C] Consumers have perfect information about prices all sellers in the market charge.
- [D] Sellers and buyers act as price takers.
- [E] Sunk cost is equal to zero.

5. The price elasticity of demand is given by the formula  $\epsilon_{Q,P} = \frac{\Delta Q}{\Delta P} \frac{P}{Q}$ . The marginal revenue of a monopolist in terms of the price elasticity of demand is:

- [A]  $\frac{MR-P}{P} = \frac{1}{\epsilon_{Q,P}}$
- [B]  $\frac{MR-P}{P} = \left(1 + \frac{1}{\epsilon_{Q,P}}\right)$
- [C]  $MR = P \left(1 - \frac{1}{\epsilon_{Q,P}}\right)$
- [D]  $MR = P \left(1 + \frac{1}{\epsilon_{Q,P}}\right)$
- [E] None of the above.

6. Suppose a railroad faces the demand for transporting coal and grain. The demand curve for transporting coal is  $P_{coal} = 40 - Q_{coal}$ , while the demand curve for transporting grain is  $P_{grain} = 15 - 0.25Q_{grain}$ . The marginal cost for transporting either commodity is 10. Suppose the railroad company practice third-degree price discrimination by setting a profit-maximizing price for each segment. What is the total amount of transportation?

- [A]  $Q_{coal} + Q_{grain} = 20$ .
- [B]  $Q_{coal} + Q_{grain} = 25$ .
- [C]  $Q_{coal} + Q_{grain} = 30$ .
- [D]  $Q_{coal} + Q_{grain} = 40$ .
- [E] None of the above.

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7. In a homogenous products duopoly, each firm has a marginal cost curve  $MC = 10$ . The market demand curve is  $P = 60 - Q_1 - Q_2$ . What are the Cournot equilibrium quantities and price in this market?

- [A]  $Q = Q_1 + Q_2 = 25$ ;  $P = 35$ .
- [B]  $Q = Q_1 + Q_2 = 30$ ;  $P = 30$ .
- [C]  $Q = Q_1 + Q_2 = 40$ ;  $P = 20$ .
- [D]  $Q = Q_1 + Q_2 = 45$ ;  $P = 15$ .
- [E] None of the above.

8. The payoffs for a game are:

	Agent B	
Agent A	Strategy 1	Strategy 2
Strategy 1	(0, 0)	(-15, 15)
Strategy 2	(15, -15)	(-100, 100)

What are the Nash Equilibria in this game?

- [A] (15, -15) and (-15, 15).
- [B] (0, 0) and (-100, 100).
- [C] (0, 0) and (15, -15).
- [D] (-15, 15) and (-100, 100).
- [E] None of the above.

9. With lottery A, there is a 0.50 chance that you receive a payoff of \$40 and a 0.50 chance that you receive a payoff \$60. With lottery B, there is a 0.80 chance that you receive a payoff of \$0 and a 0.20 chance that you receive a payoff \$250.

- [A] The two lotteries have the same expected value but that lottery A has a bigger variance than lottery B.
- [B] The two lotteries have the same expected value but that lottery A has a smaller variance than lottery B.
- [C] The two lotteries have the same variance but that lottery A has a larger expected value than lottery B.

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[D] The two lotteries have the same variance but that lottery A has a smaller expected value than lottery B.

[E] None of the above.

10. Which of the following statements is false?

[A] Externality is the effect that an action of any decision maker has on the well-being of other consumers or producers.

[B] Common property is a resource that anyone can access.

[C] A free rider is a consumer or producer who does not pay for a non-exclusive good.

[D] Consumption of a non-exclusive good by one person does not reduce the quantity that can be consumed by others.

[E] Externalities cause market failure in competitive markets.

11. Which of the following statements is false?

[A] A model is a collection of mathematical equations that are used to study a particular economic issue.

[B] Nominal GDP refers to the value of GDP measured in current prices in a given year.

[C] A key lesson of the income approach is that capital's share of GDP is relatively stable over time at about two-third.

[D] Since 1870, growth in per capita GDP has averaged about 2 percent per year in United States.

[E] Per capital GDP varies by something like a factor of 50 between the richest and poorest countries of the world.

12. A typical firm in an economy solve the following problem:

$$\max_{K,L} \Pi = \bar{A}K^\alpha L^{1-\alpha} - rK - wL$$

The firm chooses the amount of capital to rent and labor to hire in order to maximize profits.

[A] Marginal product of capital is  $MPK = \alpha \frac{Y}{K}$ .

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[B] Marginal product of labor is  $MPL = (1 - \alpha) \frac{Y}{L}$ .

[C]  $\frac{MPK}{MPL} = \frac{w}{r}$ .

[D]  $wL + rK = K^\alpha L^{1-\alpha}$ .

[E] None of the above.

13. The Solow model consists of five equations:

$$\text{Production function: } Y_t = \bar{A}K_t^\alpha L_t^{1-\alpha}$$

$$\text{Capital accumulation: } \Delta K_t = I_t - \bar{d}K_t$$

$$\text{Labor force: } L_t = \bar{L}$$

$$\text{Resource constraint: } C_t + I_t = Y_t$$

$$\text{Allocation of resources: } I_t = \bar{s}Y_t$$

The capital-output ratio in the steady state is:

[A]  $\bar{d}K^*$ .

[B]  $\bar{A}\bar{k}^\alpha$ .

[C]  $\frac{\bar{s}}{\bar{d}}$ .

[D]  $(1 - \bar{s})$ .

[E] None of the above.

14. The Romer model consists of four equations:

$$\text{Output production function: } Y_t = A_t L_{yt}$$

$$\text{Idea production function: } \Delta A_t = \bar{z}A_t L_{at}$$

$$\text{Resource constraint: } L_{yt} + L_{at} = \bar{N}$$

$$\text{Allocation of labor: } L_{at} = \bar{l}\bar{N}$$

What is the growth rate of output per person in this economy?

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[A]  $\frac{\Delta y_t}{y_t} = (1 - \bar{l}) (1 + \bar{z}\bar{l}\bar{N})$ .

[B]  $\frac{\Delta y_t}{y_t} = (1 - \bar{l}) (1 - \bar{z}\bar{l}\bar{N})$ .

[C]  $\frac{\Delta y_t}{y_t} = \bar{z}\bar{l}\bar{N}$ .

[D]  $\frac{\Delta y_t}{y_t} = (1 - \bar{l}) \bar{z}\bar{l}\bar{N}$ .

[E] None of the above.

15. The composition of the labor force in a fictitious economy is:

Civilian population, aged 16 and over	240 million
Labor force	150 million
Employed	140 million
Unemployed	10 million
Not in the labor force	70 million

The unemployment rate is:

[A] 4.2%.

[B] 6.7%.

[C] 3.4%.

[D] 29.2%.

[E] None of the above.

16. Which of the following statements about inflation is false?

[A] Inflation is the percentage change in an economy's overall price level.

[B] The classical dichotomy says that in the long run, the real and nominal sides of the economy are completely separate.

[C] The quantity theory implies that in the long run, changes in the inflation rate lead one-to-one to changes in the growth rate of money.

[D] The proposition that changes in the money supply have no real effects on the economy and only affect prices is called the neutrality of money.

[E] Fisher equation says that nominal interest rate is equal to the sum of the real interest rate and the rate of inflation.

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17. Which of the following statements about the IS curve is true?

- [A] The IS curve captures the fact that high interest rates reduce output in the short run.
- [B] The IS curve was first introduced during the Great Depression by John Maynard Keynes, who won the Nobel Prize in economics in 1972.
- [C] Central banks control the real interest rate, but the IS curve depends on the nominal interest rate.
- [D] When the real interest rate rises, the cost of borrowing faced by firms and households increases, leading them to accelerate their purchases of new equipments, factories, and housing.
- [E] The life-cycle/permanent-income hypothesis says that individual consumption depends on current income rather than average income over time.

18. Suppose a government has an initial debt of \$10 trillion, and the nominal interest rate is 4%. If the government keeps its total budget in balance, what is the growth rate of its debt?

- [A] 0%
- [B] 1%
- [C] 2%
- [D] 3%
- [E] 4%

19. Which of the following statements is true?

- [A]  $EX - IM < 0 \Rightarrow C + I + G < Y$ .
- [B] government saving =  $(Y - T - C)$ .
- [C] private saving =  $(T - G)$ .
- [D]  $IM - EX = S - I$ .
- [E] None of the above.

20. Which of the following statements is false?

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- [A] The nominal exchange rate is the rate at which one currency trades for another.
- [B] The law of one price says that in the long run, goods must sell for the same price in all countries.
- [C] Before 1973, many countries maintained a system of fixed exchange rates, in which the exchange rate of one country for another was pegged to a particular level for some period.
- [D] The central bank in Argentina must follow the monetary policy dictated by the Bank of England if it seeks to maintain a fixed exchange rate to the dollar.
- [E] Open economies can choose at most two of the following three policy goals: a stable exchange rate, monetary policy autonomy, and free flows of international finance.