國立中山大學108學年度
碩士暨碩士專班招生考試試題

科目名稱：個體經濟學【經濟所碩士班】

—作答注意事項—

考試時間：100分鐘

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國立中山大學 108 學年度碩士暨碩士專班招生考試試題

科目名稱：個體經濟學【經濟所碩士班】　　題號：403002

※本科目依簡章規定「不可以」使用計算機(問答申論題)　　

1. (15 pts) Wang is a college student with the utility function, $u(x, y) = xy$. Wang receives a monthly support of \$100, i.e. $m = 100$, from a scholarship which is the sole income source. The price vector of goods, (p_x, p_y), is (2, 4) initially.
   a) (5 pts) What is the optimal consumption bundle for Wang?
   b) (10 pts) The price vector of goods increased recently, from (2, 4) to (2.5, 7.2). What is the minimum additional income subsidy required per month to maintain Wang's utility level as before?
2. (20 pts) An individual has the expected utility function $u(w) = \sqrt{w}$ where w is initial wealth. Let lottery L offer a payoff of 16 with probability ½ and a payoff of 9 with probability ½.
   a) (5 pts) What is the expected value of the lottery?
   b) (10 pts) If the individual owns only the lottery, what is the minimum price, $\underline{p}$, that he would sell it for?
   c) (5 pts) If he does not own the lottery but $w = 100$ initially, what is the maximum price, $\bar{p}$, he would be willing to pay for it? (*Hint*: In this case, simply write down the equation involving $\bar{p}$.)
3. (25 pts) The production of x creates negative externalities for a community, which cost $e(x)$. The private cost function in the production of x is $c_x(x)$ with $c_x'(x) > 0$. Denote the other production activity as y, which causes no externalities. The cost function in the production of y is $c_y(y)$. Assume that both x and y are sold at competitive prices, p_x and p_y.
   a) (10 pts) Write down the condition of Pareto efficiency.
   b) (10 pts) How does market mechanism solve this issue in terms of adjustments in property rights?
   c) (5 pts) Use this example to discuss the essence of the Coase theorem.
4. (10 pts) Find the equilibrium of the extensive-form game below.

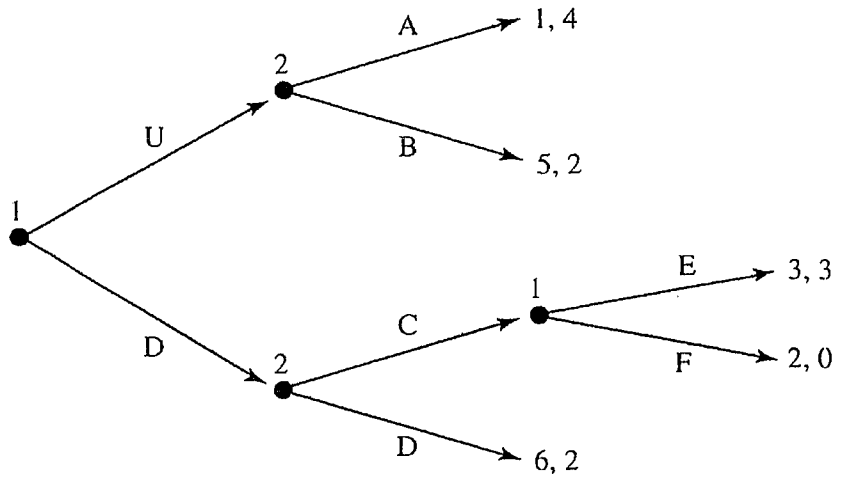

Figure 1

5. (10 pts) Explain the following terms and give an example for each: (2 pts for each) transaction cost, opportunity cost, sunk cost, reservation price, and shadow price.
6. (10 pts) A firm prefers price with fluctuations to constant price. True or false, and comment please. (For Questions 6 and 7 below, answers without comments will score zero.)
7. (10 pts) Second-degree Price Discrimination is an application of hidden action or moral hazard issues. True or false, and comment please.

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碩士暨碩士專班招生考試試題

科目名稱：總體經濟學【經濟所碩士班】

—作答注意事項—

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國立中山大學108學年度碩士暨碩士專班招生考試試題

科目名稱：總體經濟學【經濟所碩士班】　　題號：403001

※本科目依簡章規定「不可以」使用計算機(混合題)　　

I. Multiple-Choice Questions (52%, 4 points each, 單選題)

1. We learn the following about a ski resort: ticket sales $100M, snow making expenses $70M, wages $20M, interest on business loans $5M, and profits $5M. What is the contribution to GDP using the product approach?
(A) $70M. (B) $80M. (C) $95M. (D) $100M.

2. Suppose that GDP is equal to 1000, national saving is equal to 200, the current account deficit is equal to 100, and the government budget deficit is equal to 50. Private savings must equal?
(A) 150. (B) 200. (C) 250. (D) 300.

3 Suppose an economy produces only food and clothing, and that price and quantity data are given in the table below. If Year 2 is the base year, what is the net growth rate of *real* GDP?
(A) 35%. (B) 44%. (C) 58%. (D) 110%.

	Year 1	
goods	quantity	price
food	20	$6
clothing	10	$8
	Year 2	
goods	quantity	price
food	25	$10
clothing	20	$7

4. Jim's Nursery produces and sells $1100 worth of flowers. He uses no intermediate inputs and pays his workers $700 in wages, $100 in taxes, pays $200 in interest on a loan. Jim's value added to GDP is?
(A) $1100. (B) $400. (C) $300. (D) $100.

5. If the savings rate falls in the Solow growth model
(A) steady state capital per worker rises.
(B) the steady state growth rate in output increases.
(C) per worker output falls in the steady state.
(D) per capita consumption falls in the short run.

6. An increase in second-period income results in
(A) an increase in first-period consumption, an increase in second-period consumption, and an increase in saving.
(B) an increase in first-period consumption, a decrease in second-period consumption, and an increase in saving.
(C) a decrease in first-period consumption, an increase in second-period consumption, and an increase in saving.
(D) an increase in first-period consumption, an increase in second-period consumption, and a decrease in saving.

7. We know the following about a tie manufacturer: tie sales $1,300, cotton purchases $750, wages $400, interest on business loans $100, and profits $50. What is the contribution to GDP of this producer using the income approach?
(A) $550. (B) $500. (C) $450. (D) $400.

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科目名稱：總體經濟學【經濟所碩士班】　　題號：403001

※本科目依簡章規定「不可以」使用計算機(混合題)　　

2. Suppose the following national income accounts identity describes the economy

   $y = c + i$, where y, c and i are, respectively, the per worker production, consumption and investment.

   (a) Solve for the condition that describes the Golden Rule, and explain the meaning of the condition. [8 points]

   (b) Consider the three savings rates 0.2, 0.5 and 0.8. If a policymaker intends to choose one that maximizes the consumption per worker in the steady state. Suppose output per worker is governed by the production function $y = k^{1/2}$, and the depreciation of capital is $\delta=0.1$. Which of the three savings rates is the best choice for the policymaker? [12 points]

3. Please explain how the output supply is constructed and why it is positively related to the real interest rate. Besides, when the current TFP (total factor productivity) increases, how is the output supply affected? [10 points]

8. The condition, $MRS_{C,C'} = 1 + r$, describes the representative consumer's
(A) investment decision.
(B) consumption - savings decision.
(C) current period work - leisure decision.
(D) future period work - leisure decision.

9. Output supply is increasing in the interest rate because
(A) labor demand is increasing in the interest rate.
(B) labor demand is decreasing in the interest rate.
(C) labor supply is increasing in the interest rate.
(D) labor supply is decreasing in the interest rate.

10. The total government expenditure multiplier is less than one because
(A) government expenses affect labor demand.
(B) labor supply reacts to interest rate changes and consumption demand is affected by taxes.
(C) investment demand falls dramatically when the government goes into debt.
(D) the marginal propensity to consume is less than one.

11. The equilibrium effects of a temporary increase in total factor productivity include
(A) an increase in the real wage and an increase in the real interest rate.
(B) an increase in the real wage and a decrease in the real interest rate.
(C) a decrease in the real wage and an increase in the real interest rate.
(D) a decrease in the real wage and a decrease in the real interest rate.

12. The equilibrium effects of a prospective future increase in total factor productivity include
(A) an increase in the real wage and an increase in the real interest rate.
(B) an increase in the real wage and a decrease in the real interest rate.
(C) a decrease in the real wage and an increase in the real interest rate.
(D) a decrease in the real wage and a decrease in the real interest rate.

13. Ricardian equivalence implies
(A) that when the government borrows more, the market real interest rate goes up.
(B) that if the government saves less, then the nation saves less.
(C) that when taxes are cut people consume more.
(D) that consumers will save their tax cuts to pay their future taxes.

II. Problems and Calculations (48%) Explain all your answers in detail.

1. Consider an economy described by the aggregate production function: $Y = F(K,N) = K^{0.3}N^{0.7}$, where K is the aggregate capital and N is the total number of workers. In this economy, the savings rate is exogenously given and equals s, and the depreciation rate is δ.

   (a) Find the per-worker production function. [3 points]

   (b) Assuming no population growth or technological progress, find the steady-state capital stock per worker, output per worker, and consumption per worker as a function of the saving rate (s) and the depreciation rate (δ). Explain how the output per worker is affected by the saving rate (s) and the depreciation rate (δ), respectively. [15 points]

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碩士暨碩士專班招生考試試題

科目名稱：統計學【經濟所碩士班】

—作答注意事項—

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科目名稱：統計學【經濟所碩士班】　題號：403003

※本科目依簡章規定「不可以」使用計算機(問答申論題)　共 1 頁第 1 頁

Answer the following five questions, equally weighted

請務必依題序在答案卷上作答 (5 大題, 共100分)

1. (20%) Suppose that X and Y are two random variables jointly distributed over the first quadrant of the xy-plane according to pdf,

$$f_{X,Y}(x,y) = \begin{cases} y^2 e^{-y(x+1)}, & x \geq 0,\ y \geq 0; \\ 0, & elsewhere. \end{cases}$$

Find $f_Y(y)$.

2. (20%) Find the variance of X if

$$f_X(x) = \begin{cases} \frac{3}{4}, & 0 < x < 1; \\ \frac{1}{4}, & 2 < x \leq 3; \\ 0, & elsewhere. \end{cases}$$

3. (20%) Let $Y_1, Y_2, ..., Y_n$ be n independent $N(\mu, \sigma^2)$ random variables. What is the distribution of $\frac{\sum_{i=1}^{n}(Y_i - \bar{Y})^2}{\sigma^2}$? and why ? (Note: $\bar{Y} = \frac{\sum_{i=1}^{n} Y_i}{n}$)

4. (20%) Let $X_1, ..., X_n$ be a random sample from

$$f_X(x;\theta) = \left(\frac{1}{\theta^2}\right) x e^{-x/\theta}, \quad 0 < x < \infty, \ 0 < \theta < \infty.$$

Find the MLE of θ.

5. (20%) Let

$$\begin{pmatrix} X_1 \\ X_2 \\ X_3 \end{pmatrix} \sim N\left(\begin{bmatrix} 2 \\ 4 \\ 8 \end{bmatrix}, \begin{bmatrix} 4 & 2 & -3 \\ 2 & 10 & -5 \\ -3 & -5 & 16 \end{bmatrix} \right).$$

Now, let $Y_1 = X_1 - 2X_2 + 3X_3 - 4$ and $Y_2 = 2X_1 + X_2 - 3X_3 + 5$. What would $\begin{pmatrix} Y_1 \\ Y_2 \end{pmatrix}$ distribute as ?

試題請隨卷繳回