國立臺灣大學97學年度碩士班招生考試試題

選擇題共20題，每題5分，全對才給分。單複選混合，請簡述理由，並於試卷上「非選擇題作答區」依序作答。

1. 廠商甲的生產函數爲:

$$y = (kl)^{1/4},$$

y 爲產出數量，k、l 爲兩種要素的投入量。令 MP_k、MP_l 分別表示兩種要素的邊際產出 (marginal product)，$|MRTS| \equiv |dk/dl|$ 爲兩要素間的邊際技術替代率 (marginal rate of technical substitution)。

(A) $MP_k = k^{3/4} * l^{1/4}$
(B) $MP_k = k^{1/4} * l^{3/4}$
(C) $MP_l = k^{3/4} * l^{1/4}$
(D) $MP_l = k^{1/4} * l^{3/4}$
(E) $|MRTS| = k/l$

2. 承續前題。要素 k 之價格爲\$16，要素 l 之價格爲\$1。兩種要素皆爲變動要素。甲以最小的成本生產，當 $y = 10$，甲最適的要素使用量 k 與 l 爲何?

(A) $k = 100$
(B) $k = 400$
(C) $l = 100$
(D) $l = 400$
(E) 以上皆非

3. 承續前兩題。令 $AC(y)$與 $MC(y)$爲甲生產 y 單位的平均成本與邊際成本。

(A) $AC(y) = 4y$
(B) $AC(y) = 8y$
(C) $MC(y) = 4y$
(D) $MC(y) = 8y$
(E) $MC(y) = 16y$

4. 承續前3題。產品 y 的市場爲完全競爭，產品 y 之價格爲\$100。甲追求利潤極大，請問他會生產幾單位的 y?

(A) 20
(B) 25
(C) 30

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(D) 35

(E) 以上皆非

5. a、b 之效用函數分別爲: $u_a = xy$, $u_b = x + y$。若要分配10單位的 x 與10單位的 y 給兩人, 讓 a 獲得 x_a 單位的 x 與 y_a 單位的 y, 而 b 獲得剩餘的 x 與 y。下列何種分配具有 Pareto 效率性?

(A) $(x_a, y_a) = (0, 0)$

(B) $(x_a, y_a) = (4, 6)$

(C) $(x_a, y_a) = (5, 5)$

(D) $(x_a, y_a) = (7, 7)$

(E) $(x_a, y_a) = (10, 10)$

6. c、d 生產 x、y 兩物, c 工作1天的生產可能線爲: $x + y = 20$, d 工作1天的生產可能線爲: $2x + y = 30$,

(A) c 有生產 x 的比較利益 (comparative advantage)

(B) c 有生產 y 的比較利益

(C) d 有生產 x 的比較利益

(D) d 有生產 y 的比較利益

(E) 以上皆非

7. 承續前題。c、d 兩人合作生產, 1天兩人總共生產15單位的 x, 且在此前提之下, 尋求 y 總產量之極大。請問這15單位的 x 該如何生產?

(A) c 生產15單位的 x

(B) d 生產15單位的 x

(C) c 生產10單位的 x, d 生產5單位的 x

(D) c 生產5單位的 x, d 生產10單位的 x

(E) 以上皆非

8. x 市場爲完全競爭, 每家廠商的成本函數相同, 廠商 i 的平均成本函數爲:

$$AC_i(q_i) = q_i + \frac{100}{q_i},$$

q_i 爲廠商 i 的產量。市場需求函數爲: $Q = 200 - p$, 其中 Q 爲需求量, p 爲 x 的市場價格。長期均衡時,

(A) $p = \$20$

(B) $p = \$30$

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(C) $p = \$40$

(D) 市場上有10家廠商

(E) 市場上有18家廠商

9. 承續前題。若政府開始對 x 產品的廠商徵稅，廠商每出售1單位就要繳稅 $\$t$。令 Δp 表示長期均衡價格的變化，Δn 表示長期均衡廠商家數的變化。

(A) $\Delta p > \$t$

(B) $\Delta p < \$t$

(C) $\Delta n > 0$

(D) $\Delta n < 0$

(E) 以上皆非

10. 美國聯邦準備銀行 (Federal Reserve) 如何應對次級房貸 (sub-prime mortgage) 的問題？其對於美國政府公債價格之影響爲何？

(A) 美國聯邦準備銀行降息

(B) 美國聯邦準備銀行升息

(C) 美國政府公債價格上升

(D) 美國政府公債價格下降

(E) 美國政府公債價格不變

11. Hillary and Barack are playing a game. Hillary offers to place a bet on the outcome of the game at fair odds. Barack is risk-averse and believes that he has a 60% chance of winning the game.

(A) Barack will always accept the bet.

(B) Barack will accept the bet if the amount of the bet is large enough.

(C) Barack will accept the bet if the amount of the bet is small enough.

(D) Barack will never accept the bet.

(E) None of the above.

12. Suppose there are two types of labors: *skilled labor* and *unskilled labor*. A person cannot change from unskilled labor to skilled labor and vice versa. The slopes of the supply curves for both types of labors are positive and finite. These two types of labors are assumed to be substitutes in production. The government in Taiwan increased the minimal wage rate from NT$66 per hour to NT$95 per hour on July 1, 2007 and the law applies to both types of labors and is strictly enforced. Before the policy change, the equilibrium wages for skilled and unskilled labors were NT$120 and NT$80, respectively.

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(A) The quantity of employed unskilled labor must have declined after the policy change.

(B) The quantity of employed skilled labor must have declined after the policy change.

(C) The wage rate of skilled labor must have increased after the policy change.

(D) The demand for unskilled labor must have shifted downward after the policy change.

(E) None of the above.

13. Suppose the demand for gasoline is $D(p) = 120 - p$. There is a monopolistic firm operating in this market. Its total cost function of producing q units is $TC(q) = 10+2q^2$. The production of gasoline pollutes the air in the surrounding area. The cost of the damage is q^2 when q units of gasoline are produced. Assume that people living in the surrounding area do not consume gasoline. The objective of the firm is to maximize its own profit. Price discrimination is infeasible in this market. Assume that the only method to reduce pollution is by changing the quantity of gasoline production.

(A) When the victims of the pollution cannot negotiate with the firm, the firm set the gasoline price at $p = 100$.

(B) If the firm has the property right to make pollution and it is costless for the pollution victims to negotiate with the firm to reduce pollution, the price of gasoline will be $p = 105$.

(C) If the people living in the surrounding area have the property right of clean air and it is costless for them to negotiate with the firm, the price of gasoline will be $p = 110$.

(D) If the victims of the pollution cannot negotiate with the firm, the government can increase the social gain by subsidize the firm \$5 per unit of gasoline production.

(E) None of the above.

14. Suppose X is an industry of monopolistic competition. All firms face a downward-sloping demand curve. Firms can enter or exit the industry in the long run.

(A) In the short run equilibrium, a firm may earn positive profit in this industry.

(B) In the short run equilibrium, a firm may earn negative profit in this industry.

(C) In the long run equilibrium, all firms must earn zero profit in this industry.

(D) In the long run equilibrium, a firm's average cost at its output level must be greater than its marginal cost at its output level.

(E) None of the above.

15. You are the owner of a monopolist. Currently, you choose a single price to maximize your profit. Your production causes neither external costs nor external benefits.

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(A) Your choice of the price is higher than the socially optimal level.

(B) The deadweight loss may decline if the taxpayers subsidize you NT$100 per unit of output.

(C) If you can use first degree price discrimination, the deadweight loss must decline.

(D) If you are required by the government to earn zero profit, the output level must be lower than the socially optimal level.

(E) None of the above.

16. Suppose Alice is impatient. Plot her indifference curves on a graph with *current consumption* on the horizontal axis and *future consumption* on the vertical axis.

(A) Impatience implies her indifference curves must be convex.

(B) Her indifference curves may be straight lines.

(C) Her indifference curves must have absolute slopes greater than one along the 45° line.

(D) Her indifference curves depend on her endowment.

(E) None of the above.

17. Suppose that both current consumption and future consumption are normal good for all consumers.

(A) If everyone expects global warming will reduce future supply but not current supply, the demand for current consumption must decline.

(B) If everyone expects global warming will reduce future supply but not current supply, the real interest rate must decrease.

(C) If everyone expects the recent storm will decrease current supply but have no effect on future supply, the demand for current consumption must decline.

(D) If everyone expects the recent storm will decrease current supply but have no effect on future supply, the real interest rate may either go up or down.

(E) None of the above.

18. Consider an industry of an homogeneous good. All firms take rivals' outputs as given and make their own output decisions simultaneously. The demand for the good is downward-sloping. Originally, there were three firms (A, B, and C) with identical constant marginal cost in the industry. No other firm can enter this industry because of government regulation. One day, Firm A and Firm B found that it would be profitable if they could merge together. Consequently, they become a merged firm, called "AB". There are only two firms (AB and C) remaining in the industry after the merger. Suppose that the merger may reduce the marginal cost of Firm AB because of economics of scale, but it

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is also possible that the marginal cost is unchanged. Because we do not observe the cost data, we are not sure whether the marginal cost have declined after the merger.

(A) If the price of the good decreased after the merger, the merger must have reduced the marginal cost of the merged firm AB.

(B) If the price of the good decreased after the merger, the social gain must have become higher.

(C) If the merger decreased the marginal cost, consumers must be better off.

(D) The profit of Firm C must have increased after the merger.

(E) None of the above.

19. Consider the following rule for an auction with two buyers. Each buyer submits a bid $b_i \in \{0, 1, 2, 3\}$ simultaneously, $i = 1, 2$. The winner of the auction is the buyer who submits the higher bid. When the two bids are equal, the winner is selected from the two buyers randomly with equal probability. The winner needs to pay a price. The price is *not* is his own bid, but it is equal to his rival's bid. If a buyer wins the object, his payoff is his valuation of the object, v_i, minus the price he pays. If a buyer does not win, his payoff is zero. Each buyer maximizes his own expected payoff. Suppose that $v_1 = 1$ and $v_2 = 2$.

(A) Submitting $b_1 = 1$ is Buyer 1's dominant strategy.

(B) $(b_1, b_2) = (0, 3)$ is a Nash equilibrium in the auction game.

(C) $(b_1, b_2) = (1, 2)$ is a Nash equilibrium in the auction game.

(D) $(b_1, b_2) = (1, 2)$ is a Pareto-optimal outcome for the two buyers.

(E) None of the above.

20. Each potential user of the NTU inter-campus shuttle bus is willing to pay up to NT\$27 per ride, provided the shuttle bus is not crowded. When the shuttle bus becomes crowded, willingness to pay goes down. Specifically, when there are q passengers on the bus, each user is willing to pay up to $\$(27 - q^2/100)$ for a ride. For simplicity, assume the cost of operating the bus is independent of the number of passengers. (q need not be an integer because it can mean the average number of passengers on a bus.)

(A) If it is free to ride the shuttle bus, there are $30\sqrt{3}$ passengers on a bus.

(B) The optimal number of passengers on the bus is 25.

(C) If the university decides to charge \$20 for a ride, the number of passengers on the bus is less than the socially optimal level.

(D) Social gain must increase if the university decides to charge a positive price.

(E) None of the above.

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