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Principle of Microeconomics

Final Examination

I. Multiple Choice Questions (62.5%)

Write down your paper letter on the top right hand corner of your Scantron sheet. Choose the most correct answer from the alternatives given, and shade the correct answer in your Scantron sheet.

1. Consider the game of chicken below. There are two drivers, both headed for a single-lane bridge from opposite directions. The first to swerve away, who is the chicken, yields the bridge to the other. If neither player swerves, the result is a costly deadlock in the middle of the bridge, or a potentially fatal head-on collision. How many pure strategy Nash equilibria are in the game?

		Driver 2	
		Swerve	Straight
Driver 1	Swerve	0, 0	-1, 1
	Straight	1, -1	-1000, -1000

(A) 0

(B) 1

(C) 2

(D) 4

2. Consider an (oligopolistic) market with two homogeneous firms, and there are no consumer search costs. If firms compete in the way as in the Bertrand model. That is, firms compete by setting prices simultaneously and consumers want to buy everything from a firm with a lower price. When two firms charge the same price, consumers' demand is split evenly between them. If the demand function of the market is $Q = 40 - P$, and two firms produce with identical marginal costs of 10. Which of the following is true in the Nash equilibrium?

$y = 40 - x$

$x + y = 40$
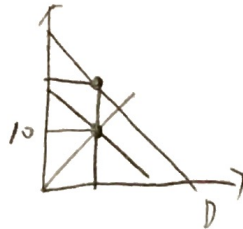
(A) The equilibrium price is greater than 10.

(B) The equilibrium quantity is 15 units in total.

(C) The equilibrium quantity is 15 units per firm.

(D) The equilibrium quantity is 30 units per firm.

3. Consider the prisoners' dilemma below. If the two players will play the same game together repeatedly, and they have the same discount factor δ. Both of them use grim trigger, that is, as soon as the other deviates, one will deviate for the remainder of the game. The rationality of both players is common knowledge. What is the infimum (minimum) of the discount factor δ that can make the players cooperate?

		Player 2	
		Cooperate	Deviate
Player 1	Cooperate	2, 0	-3, 2
	Deviate	3, -5	-2, -1

(A) 3/4 $\dfrac{a_1}{1-r}$ $\dfrac{1}{1-\delta^r}$

(B) 2/3

(C) 1/2

(D) 1/5 $\dfrac{1}{1-\delta^r}$

4. Bob gave his girlfriend, Alice, a gift for her birthday. However, Alice broke off the relationship since she thought the gift was too inappropriate for her. What "economic concept" may help to explain this story?

(A) Moral hazard
(B) Adverse selection
(C) Princess sickness
(D) Signaling

5. According to Arrow's impossibility theorem, there is no voting system which can choose among alternatives that satisfies all properties below:

(1) Unanimity

(2) Transitivity

(3) Independence of irrelevant alternatives

(4) No dictators

Which of the properties may be violated by voting pairwise under the majority rule?

(A) (2)
(B) (3)
(C) (2)(3)
(D) (1)(2)(3)

6. A democratic society is deciding how much money to spend on public good, such as the national defense. Let the maximum of the preferred budgets among all voters be the numeraire, that is, the maximum of the preferred budgets among all voters is 1. If the minimum of the preferred budgets among all voters is 0, and the cumulative proportion of the population of the voters whose preferred budgets don't exceed x, where $0 \leq x \leq 1$, is 到底比率?

$$\min (4x, \frac{5}{4}x + \frac{1}{4}, \frac{2}{3}x + \frac{1}{3})$$

How much money would you expect to spend on public good in the democratic society according to the median voter theorem?

(A) 0.20

(B) 0.25

(C) 0.50

(D) 0.67

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7. The citizens of Mayville are having a severe budget shortage and are faced with eliminating athletics from the town high school. The town administrator has determined that the town can afford to maintain one sport. Exactly one of the three choices will prevail, and the choice will be made by way of pairwise voting, with the majority determining the outcome on each vote. The preferences of the voters are summarized in the table below.

	Voter Type A	Voter Type B	Voter Type C
Percent of Electorate	20	42	38
First choice	Hockey	Football	Basketball
Second choice	Football	Basketball	Hockey
Third choice	Basketball	Hockey	Football

Refer to the above table. The town administrator is a huge basketball fan. If he wants to ensure that basketball is the winning sport, how should he set up the voting?

(A) First vote: hockey vs. basketball; Second vote: winner of first vote vs. football

(B) First vote: hockey vs. football; Second vote: winner of first vote vs. basketball

(C) First vote: basketball vs. football; Second vote: winner of first vote vs. hockey

(D) It is impossible for basketball to win according to Arrow's impossibility theorem.

Figure 1
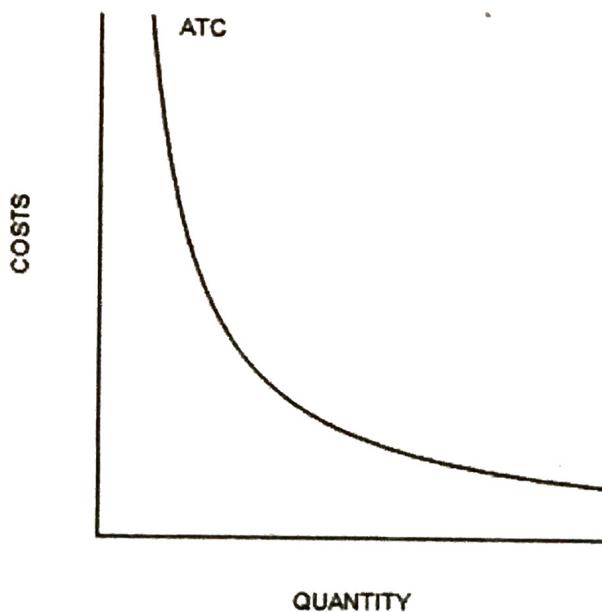
8. **Refer to Figure 1**. The shape of the average total cost curve reveals information about the nature of the barrier to entry that might exist in a monopoly market. Which of the following monopoly types best coincides with the figure?

(A) Ownership of a key resource by a single firm

(B) Natural monopoly

(C) Government-created monopoly

(D) A patent or copyright monopoly

9. **Refer to Figure 1**. The shape of the average total cost curve in the figure suggests an opportunity for a profit-maximizing monopolist to take advantage of

(A) economies of scale.

(B) diseconomies of scale.

(C) diminishing marginal product.
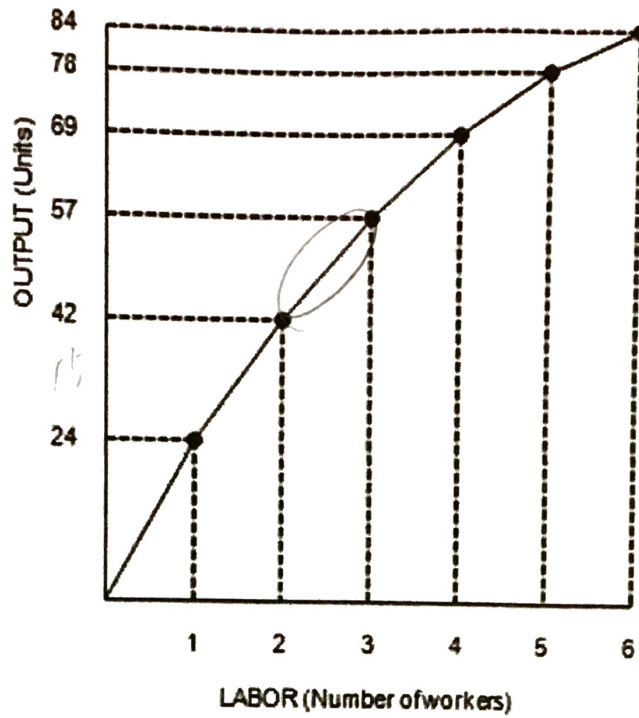
(D) increasing marginal cost.

Figure 2
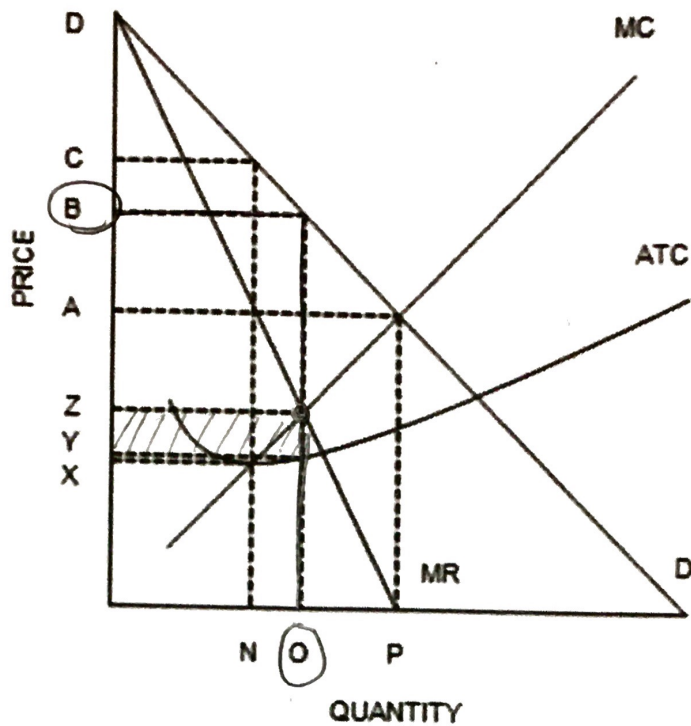
10. **Refer to Figure 2.** What price will the monopolist charge in order to maximize profit?
   (A) O
   (B) Z
   (C) B
   (D) C

11. Because a firm's demand for a factor of production is derived from its decision to supply a good in the market, it is called a
   (A) marginal product of demand.
   (B) secondary demand.
   (C) derived demand.
   (D) compensatory demand.

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Figure 3

12. **Refer to Figure 3.** The marginal product of the fifth worker is

   (A) 9 units of output.
   (B) 10 units of output.
   (C) 12 units of output.
   (D) 15 units of output.

13. **Refer to Figure 3.** Suppose the firm hires each unit of labor for $108 per day, and each unit of output sells for $12. What is the value of the marginal product of the third worker?

   (A) $144
   (B) $108
   (C) $180
   (D) $216

$$VMPL = MPL \times P$$
$$\Delta Profit = VMPL - W$$

15
12
30
15
180

7

Suppose the government implemented a negative income tax and used the following formula
to compute a family's tax liability:
Taxes owed = (1/4 of income) − $16,000

14. **Refer to the above scenario.** This negative income tax would guarantee what minimum
level of income to every family?

B

    (A) $4,000
    (B) $16,000
    (C) $64,000
    (D) None of the above

15. **Refer to the above scenario.** Under this system, a family earning $46,000 before taxes
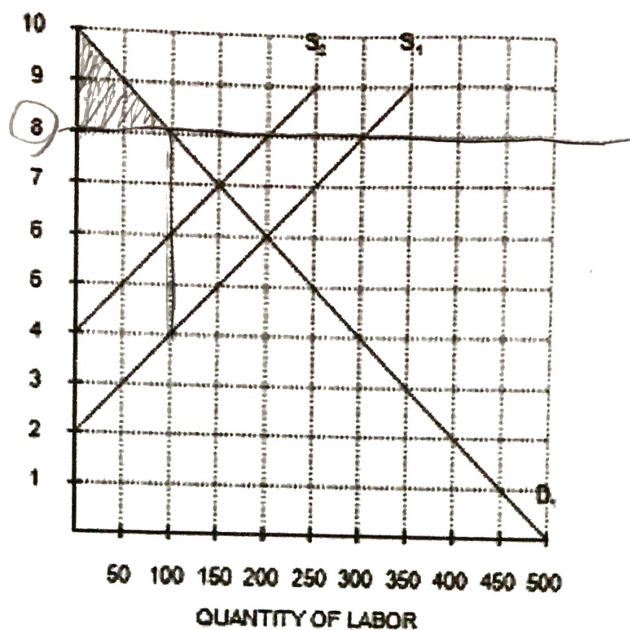would have how much after-tax income?

D

    (A) -$4,500
    (B) $41,500
    (C) $46,000
    (D) $50,500

$$\left(46000 \times \frac{1}{4}\right) - 16000$$

Figure 4

16. **Refer to Figure 4.** Given demand for labor, D_1, and supply of labor, S_1, what is the surplus of labor if a minimum wage of $8 per hour is imposed on this market?
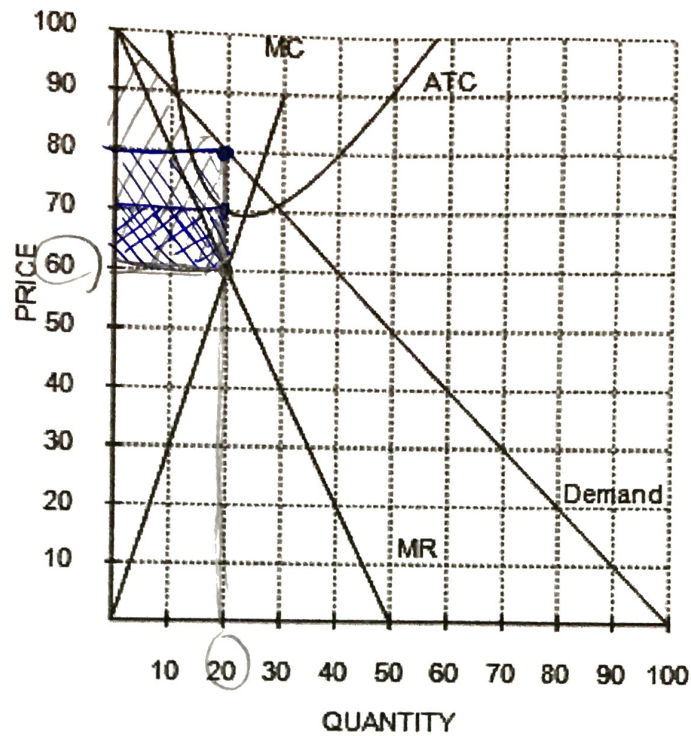
(A) 250
(B) 150
(C) 200
(D) 100

$= \dfrac{100 \times 2}{2}$

17. **Refer to Figure 4.** If a union is successful in reducing supply from S_1 to S_2, which of the following could be considered an efficiency wage?

(A) $5
(B) $6
(C) $7
(D) $8

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Figure 6

20. **Refer to Figure 6.** How much consumer surplus will be derived from the purchase of this product at the monopolistically competitive price?

(A) $200
(B) $400
(C) $1,600
(D) $600

21. **Refer to Figure 6.** How much profit will the monopolistically competitive firm earn in this situation?
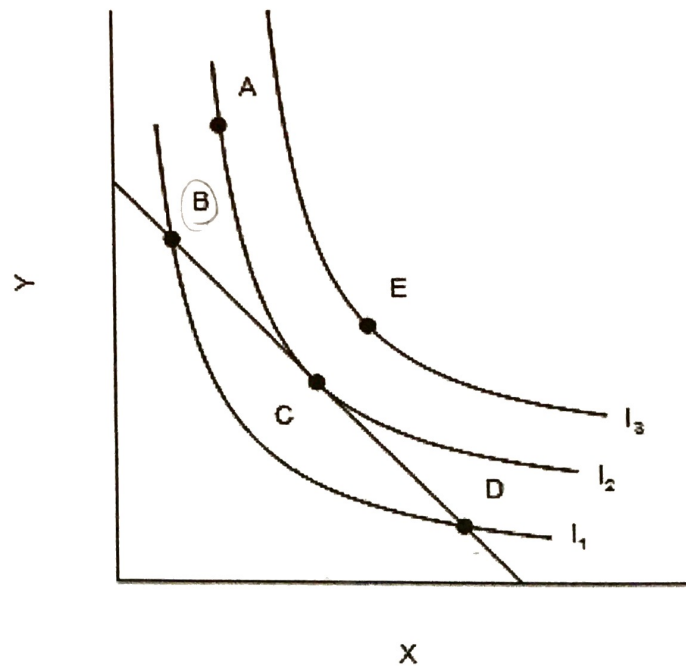
(A) $0
(B) $1,600
(C) $200
(D) $400

22. **Refer to Figure 6.** Assuming the firm is maximizing profit, this firm is operating

(A) in the short run and earning a positive economic profit.
(B) in the short run and breaking even.
(C) in the long run and earning a positive economic profit.
(D) in the long run and incurring and economic loss.

Figure 7

23. **Refer to Figure 7.** Given the budget constraint depicted in the graph, the consumer's optimal choice will be point

    (A) A
    (B) B
    (C) C
    (D) D

24. **Refer to Figure 7.** It would be possible for the consumer to reach I₃ if

    (A) the price of Y increases.
    (B) the price of X increases.
    (C) income decreases.
    (D) the price of Y decreases.
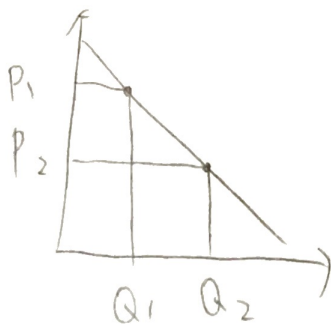
25. **Refer to Figure 7.** Bundle B represents a point where

    (A) $MRS_{xy} > P_y/P_x$
    (B) $MRS_{xy} = P_x/P_y$
    (C) $MRS_{xy} < P_x/P_y$
    (D) $MRS_{xy} > P_x/P_y$

12

II. Problems (37.5%)

Note: please show the complete calculation process accompanying with your answers. Answers without appropriate calculation process and explanation will not be given points.
請列出計算過程。只列出答案而無計算及理由說明者，即使答案正確，並不予計分。

1. (5%) Suppose that UDTS Co. has market power for her wafer product in both domestic and foreign market, where the price elasticity of demand for this product is 2 in domestic market and 5 in foreign market, respectively. UDTS is a profit-maximizer. It cannot be arbitraged 套利 between these two markets. Find the relationship between the domestic price P_d and the foreign price P_f?

$$\frac{\Delta P}{\Delta Q} = \frac{\frac{P_2 - P_1}{P_2 + P_1}}{\frac{Q_2 - Q_1}{Q_2 + Q_1}} \qquad \frac{\frac{\Delta P}{P_2 + P_1}}{\frac{\Delta Q}{Q_2 + Q_1}}$$

$$\frac{\Delta Q}{\Delta P} \times \frac{P_2 + P_1}{Q_2 + Q_1}$$

$$\frac{\Delta P}{\Delta Q}$$

$$\frac{\Delta P}{\Delta Q} \times \frac{Q_2 + Q_1}{P_2 + P_1}$$

2. (12%) Walmart Co. is the only employer of special labor force in Sunny Town. If Walmart Co. faces a supply curve of this special labor force is $W = 100 + 10L^s$ and has a demand curve of $W = 700 - 10L^d$, where W is the wage rate and L is the unit of labor. Find:

(1) What are the equilibrium labor employed and wage rate in this special labor force market? (Hint: the marginal expenditure curve ME of labor supply is $ME = 100 + 20L^s$) (5%)

(2) When employees can bargain over wage rate with the employer, what is the possible range of the bargaining wage rate? (4%)

(3) What is total social surplus or loss in this labor market? (3%)

3. (8%) Laa Newww Co. is one of many producers in the shoes market. Assume that Laa Newww is currently earning short-run economic profit.

(1) Suppose that over a long time consumers become more focused on stylistic difference among shoe brands. How would this change in attitudes affect each producer's price elasticity of demand? In the long run, how will this change affect Laa Newww's price, output, and profit using a correctly labelled diagram? (4%)

(2) At the profit-maximizing price one identified in part (1), is Laa Newww's demand curve elastic or inelastic? Explain. (4%)
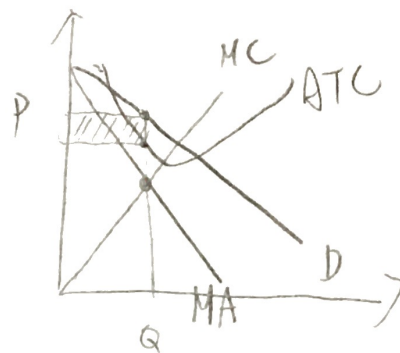
4. (12.5%) Suppose two cities in Taiwan. In City A, ten families have incomes of $20,000 each, one family with $50,000, and ten families with income of $100,000 each. In City B, ten families have incomes of $23,000 each, one family with $100,000, and ten families have incomes of $230,000 each. Please answer:

(1) What are the income levels of the poverty line 貧窮線所得水準 in City A and City B, respectively? (2.5%)

(2) In which City is the distribution of income more unequal? In which City is the problem of poverty likely to be worse? (2.5%)

(3) Which distribution of income in City A and City B would John Rawls prefer? Explain. (2.5%)

幫助最糟的那群人

(4) Which distribution of income would a Utilitarian 利他主義者 prefer? Explain. (2.5%)

一樣的錢對窮人效用較大

(5) Which income distribution would Robert Nozick consider more equitable? Explain. (2.5%)

程序公平

完卷　祝 假期 愉快　*All's well that ends well.*

A   B

10 100,000 10,000 10 230000 1人 23,000

1 50,000 50,000 1 100000 1人 100,000

10 20,000 2,000 10 23000 1人 2300

21戶 170000 21戶 353000

MCQs

A 卷

BACCA / CBDCD / CAACA / CDDCC / BDABB

B 卷

CDCAA / CACDD / CCBDA / BBBAC / CACBD

C 卷

CCBDA / BBBAC / CACBD / CDCAA / CACDD

Problems

1.

略

2.

(1)

L_1=20, W1=500

(2)

W_m=300≤W≤ W1=500

(3)

△abc=1000

3.

略

4.

(1)

A $30,000; B $60,000

(2)-(5)

略