

NATIONAL UNIVERSITY OF SINGAPORE

EC2101 MICROECONOMIC ANALYSIS I

(SEMESTER I : AY2006-2007)

Time Allowed : 2 Hours

INSTRUCTIONS TO CANDIDATES

1. This examination paper contains two sections and comprises FIFTEEN (15) printed pages, including this page.
2. **Section A** contains TWENTY (20) multiple-choice questions. Each question carries one mark. Please **shade your answers on the bubble form provided**. The total mark for this section is TWENTY (20).
3. **Section B** contains FOUR (4) short-answer questions. The number of marks for each part of a question is specified at the end of each question. Please attempt ALL questions. **Write your answers clearly within the space provided in this booklet**. The total mark for this section is FORTY (40).
4. The total mark for this examination is SIXTY (60).
5. Please **write and shade** your matriculation number on the **bubble form** provided.
6. Please write your matriculation number in the space below.

Matriculation No:

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THIS IS A CLOSED-BOOK EXAMINATION.

Section A: Multiple-Choice Questions

This section contains TWENTY (20) multiple-choice questions. Each question carries ONE (1) mark. For each question, choose the correct answer, and shade the letter of your choice on the bubble form provided.

1. There are 100 identical firms in a coconut oil industry. The short-run marginal cost of each firm is $SMC = 10 + q$. The industry demand curve is $P = 30 - 3Q/100$. Quantity is measured in barrels and price in dollars. The equilibrium price and quantity of coconut oil produced by this industry are:
 - a. 100 barrels; \$20/barrel
 - b. 500 barrels; \$15/barrel
 - c. 1000 barrels; \$10/barrel
 - d. 5000 barrels; \$5/barrel

2. In question 1 above, if the recent haze would to destroy the coconut crop from which the oil is produced and none is produced during the time period under consideration, the producer surplus that would be lost in the coconut oil market is
 - a. \$7500
 - b. \$2000
 - c. \$1250
 - d. \$500

3. Although rice is a staple of the Japanese diet, the Japanese government has long restricted the importation of rice into Japan. The result of this import quota is
 - a. to decrease the price of Japanese rice to the Japanese.
 - b. to decrease the consumer surplus of Japanese rice consumers.
 - c. to decrease the producer surplus of Japanese rice producers.
 - d. to increase the consumption of rice by the Japanese.

4. Price ceilings
 - a. may decrease consumer surplus if demand is sufficiently inelastic.
 - b. cause quantity to be higher than in the market equilibrium.
 - c. always increase consumer surplus.
 - d. may decrease consumer surplus if demand is sufficiently elastic.

5. A monopolist's demand curve is $P = 100 - Q$. The marginal cost of production is constant at \$20. Assume that fixed costs are \$500. If the firm is a profit-maximizing enterprise, the welfare loss to society because of this monopoly's strategy is
- a. \$500
 - b. \$800
 - c. \$1500
 - d. \$2400
6. In question 5 above, if there is a profits tax of 25%, the after-tax profit will be
- a. \$825
 - b. \$1100
 - c. \$1200
 - d. \$1600
7. Which statement is true for a single-price monopoly that is operating on the demand curve $P = 75 - 5Q$ at the point where price is \$37.50?
- a. The firm should definitely not lower its price.
 - b. The firm should definitely lower its price.
 - c. If the marginal cost is zero, the firm should definitely raise its price.
 - d. None of the above can be stated with assurance.
8. Unlike a competitive buyer,
- a. a monopsonist faces an upward-sloping industry supply.
 - b. a monopsonist pays a different price for each unit purchased.
 - c. a monopsonist sets marginal value equal to marginal expenditure.
 - d. the price that a monopsonist pays depends on the number of units purchased.
9. A perfect price-discriminating monopolist will
- a. leave no consumer surplus for his customers.
 - b. receive the same marginal revenue from each customer.
 - c. produce the maximum deadweight loss to society.
 - d. maximize consumer surplus.

10. In third-degree price discrimination a firm faces two markets. In the first market the firm charges \$30 per unit, and in the second market it charges \$22 per unit. We can conclude that the first market has
- a more inelastic demand.
 - a less inelastic demand.
 - greater consumer incomes.
 - a higher marginal cost of production.
11. The demand for action figures based on characters from children's movies is extremely high around the time the movie is released. In this high demand period, the demand for action figures is $Q_h = 300000 - 10000P$. Some time after the movie is released, interest in the action figures wanes. In this low demand period, demand for the action figures becomes $Q_w = 100000 - 25000P$. Suppose the marginal costs of producing the action figures are constant at \$1.50, the optimal prices in the two different periods are:
- $P_h = \$22.875$; $P_w = \$3.375$
 - $P_h = \$15.75$; $P_w = \$2.75$
 - $P_h = \$9.455$; $P_w = \$1.055$
 - $P_h = \$3.95$; $P_w = \$0.65$
12. The new snack shop on campus sells hamburgers (h) and fries (f). There are four different types of customers whose willingness-to-pay are presented in the table below. The marginal cost of producing a hamburger is \$0.60, and the marginal cost of an order of fries is \$0.40.

	French Fries	Hamburger
Type I	\$1.80	\$0.15
Type II	\$1.00	\$1.00
Type III	\$0.80	\$1.20
Type IV	\$0.10	\$1.80

The most profitable pricing strategy is

- selling the products only as a bundle at the price of \$1.90.
- selling the products separately at prices $P_f = P_h = \$1.80$, or as a bundle at a price of \$1.90.
- selling the products separately at prices $P_f = P_h = \$1.80$, or as a bundle at a price of \$1.95.
- selling the products separately at prices $P_f = P_h = \$1.80$, or as a bundle at a price of \$2.00.

13. The market demand curve shared by two interdependent firms is $P = 50 - QT$, where $QT = Q_1 + Q_2$. Their MCs are constant at \$10. Suppose the two firms act as Cournot duopolists, the equilibrium output and price of both firms would be:
- a. 42; \$8
 - b. 27; \$23
 - c. 40; \$10
 - d. 20; \$30
14. In question 13 above, if firm 1 operated like a Stackelberg leader, the output of each firm would be:
- a. $Q_1 = 10$; $Q_2 = 5$
 - b. $Q_1 = 20$; $Q_2 = 10$
 - c. $Q_1 = 30$; $Q_2 = 20$
 - d. $Q_1 = 40$; $Q_2 = 30$
15. The cost of variety in monopolistic competition tends to be borne
- a. more heavily by those who desire the variety.
 - b. more heavily by those who dislike the variety.
 - c. in an unpredictable random fashion.
 - d. by the producers.
16. If each product had only one quality or characteristic that mattered to consumers, the monopolistic competition model would
- a. be more like the monopoly models.
 - b. be more like the competitive model.
 - c. be more like the oligopoly models.
 - d. not be modified in any of the above ways.
17. The labour supply curve for a worker seeking a constant target level of income is
- a. positively sloped throughout the relevant range.
 - b. negatively sloped throughout.
 - c. horizontal throughout.
 - d. vertical throughout.

18. If you hire me at \$10 an hour, but have to pay \$12 an hour to attract a second worker to work with me, I will feel unfairly treated and will quit working for you. You will then have only one worker anyway, so you might as well have kept me at \$10 an hour. To prevent this problem, you hire us both at \$12 each. This means that your marginal expenditure for the second worker is
- a. \$10
 - b. \$12
 - c. \$14
 - d. \$24
19. You are given the following supply and demand equations for labour in a given industry:
- Supply of labour: $W = 0.25L$
Demand for labour: $W = 10 - 0.25L$
- If a minimum wage of \$8 is applied, the number of unemployed workers (those laid off and those looking for work unsuccessfully at the higher wage) would amount to
- a. 8
 - b. 12
 - c. 24
 - d. 32
20. Suppose the labour market in question 19 above is for a community in which monopsonistic labour conditions apply. If a \$5 minimum wage is now applied to the monopsonistic market, the number of workers employed would be
- a. 8
 - b. 12
 - c. 20
 - d. 32

Section B: Short-Answer Questions

This section contains FOUR (4) short-answer questions. The total mark for each question is TEN (10). Write your answers in the space provided in this booklet.

ATTEMPT ALL QUESTIONS

1. Far East Polymer makes 80 fiberglass truck hoods per day for truck distributors in Singapore. Each hood sells for \$500. Far East sells all its output to the truck distributors. The price elasticity of demand for hoods is -0.4 and the price elasticity of supply is 1.5.
 - a. Derive the supply curve of and demand curve for truck hoods.
(4 marks)
 - b. If the government imposes a per unit tax of \$25 per hood manufactured, what would the equilibrium price and quantity of hoods be for the truck manufacturers?
(4 marks)
 - c. Would a per unit tax on hoods change the revenue received by Far East?
(2 marks)

2. A paper company in Indonesia dumps non-degradable waste into a river that flows by the firm's plant. The firm estimates its production function to be:

$$Q = 6KW$$

where Q = annual paper production measured in tons, K = machine hours of capital, and W = litres of polluted water dumped into the river per year. The firm currently faces no environmental regulation in dumping waste water into the river. Without regulation, it costs the firm \$7.50 per litre dumped. The firm estimates a \$30 per hour rental rate on capital. The operating budget for capital and waste water is \$300,000 per year.

- a. Using the method of Lagrange multipliers, determine how much capital and waste water should the firm employ? How much output will the firm produce?
- b. Suppose the Indonesian environmental protection agency imposes a \$7.50 pollution fee for each litre that is dumped. Assuming that the firm intends to maintain its pre-pollution fee output, how much capital and waste water should the firm employ? How much will the firm pay in pollution fees? What happens to the firm's cost as a result of the pollution fee?

(5marks)

(5 marks)

3. The industry demand curve for a particular market is:

$$Q = 1800 - 200P.$$

The industry exhibits constant long-run average cost at all levels of output, regardless of the market structure. Long-run average cost is a constant \$1.50 per unit of output.

- a. Calculate the market output, price (if applicable), consumer surplus, and producer surplus for each of the scenarios below.
 - i. Perfect Competition
 - ii. Pure Monopoly
 - iii. First-Degree Price Discrimination

(8 marks)
- b. Compare the economic efficiency of each scenario.

(2 marks)

4. Suppose broadband internet service in the local market is supplied by Singapore Broadband Network (SBN). SBN has two types of consumers. Local businesses are the first type of customers SBN services. Their demand for broadband service is $Q_b = 6500 - 100P$. The second type of customers SBN services are residential customers. Residential demand is $Q_r = 12500 - 500P$. SBN's marginal cost is $MC(Q_b+Q_r) = 20/3 + (Q_b+Q_r)/150$. Suppose SBN can practise third-degree price discrimination.
- a. Calculate the profit-maximizing prices SBN charges business and residential customers.
(6 marks)
- b. Verify that given the prices charged, $P_b/P_r = [1+1/E_r]/[1+1/E_b]$. E_r is the price elasticity of demand of the residential customers, and E_b is the price elasticity of demand of the business customers.
(4 marks)

(This is a blank page. Use this page if you need more space for any of the answers.)