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UNIVERSITY OF LONDON

279 0066 ZB

BSc degrees and Diplomas for Graduates in Economics, Management, Finance and the Social Sciences, the Diploma in Economics and Access Route for Students in the External Programme

Microeconomics

Friday, 2 June 2006 : 2.30pm to 5.30pm

Candidates should answer **EIGHT** of the following **FOURTEEN** questions: **FIVE** from Section A (5 marks each) and **THREE** from Section B (25 marks each). **Candidates are strongly advised to divide their time accordingly.**

A hand held calculator may be used when answering questions on this paper but it must not be pre-programmed or able to display graphics, text or algebraic equations. The make and type of machine must be stated clearly on the front cover of the answer book.

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SECTION A

Answer **five** questions from this section (5 marks each).

1. Suppose a monopolist has a constant marginal cost. In what circumstances, would it respond to a specific tax levied on each unit of its output by raising its price by:
 - i. more than the tax?
 - ii. less than the tax?

2. The government is considering two policies to discourage smoking:
 - i. a tax on cigarettes,
 - ii. a law setting a minimum price (price floor) for cigarettes.

Compare the effects of the policies on consumers, producers, government finances, and economic efficiency. (Assume the market for cigarettes is competitive and ignore any external effects.)

3. In the Chamberlin model of monopolistic competition, an entrant into the market can expect to sell $n / (n + 1)$ of the output sold by each of the n established firms. In the circular model of spatial competition, an entrant can expect to sell only one half of an established firm's output.
 - (a) Are these statements correct? Explain, briefly.
 - (b) What does your response to (a) imply about the long-run equilibrium profits earned by firms in each of the models?

4. Suppose the private and social marginal cost of supplying education is $PMC = SMC = Q$, where Q is the quantity of education. Further, assume the inverse demand for education is given by $P = 80 - Q$ and the marginal external benefit of education is $MEB = 20 - \frac{1}{4}Q$.
 - (a) How much output would a competitive education industry produce?
 - (b) What is the socially efficient level of education?
 - (c) What per-unit subsidy on education would induce the education industry to supply the socially efficient level of education?

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5. A monopsonist uses only labour to produce product X , which she sells in a competitive market at a fixed price, $P_X = 1$. Her production function is $Q_X = 6L - 3L^2 + 0.2L^3$ and the labour supply function is $w = 6 + 3L$, where w is the wage rate and L is the quantity of labour. Determine the values of L and w that maximise profit.
6. Two firms are competing in an oligopolistic industry. The firms choose independently either to increase research and development (R&D) expenditure or hold it constant. The profits associated with each pair of choices by the two firms (1,2) are shown in the table:

		Firm 2	
		Increase R&D	Do not increase R&D
Firm 1	Increase R&D	25,9	33,10
	Do not increase R&D	30,13	36,12

- (a) If both firms decide their strategies simultaneously, what is the Nash equilibrium? Explain.
- (b) If Firm 1 could move first and credibly commit to its R&D strategy, what is its optimal strategy? What will Firm 2 do?

SECTION B

Answer **three** questions from this section (25 marks each).

7. (a) Explain the conditions that must be satisfied for a consumer to be at a consumption optimum. Describe two different circumstances in which a change in the price of a good (X) will not cause a consumer to alter her consumption of all other goods. (Assume that the consumer's income is unchanged.)
- (b) Use indifference curve analysis to answer **one** of the following questions:
- Jack signed a long-term contract when he was hired whereby his employer increases his wage each year by the same percentage as an index measuring the cost of living. The index is in the form of a Laspeyres price index. Carefully explain the circumstances in which Jack would be better off if the prices of goods increased.
 - A music-loving student spends his income of \$300 per month on compact discs (CDs) and other goods. He currently must pay \$20 per CD and, given this price, he buys 9 CDs per month and spends \$120 on other goods. He has just received an advertisement announcing that he can join a CD club. He would have to pay a membership fee of \$100 per month, but then he would be able to buy as many CDs as he wishes at \$10 each. Would he join the club and, if so, how would joining the club affect the basket of goods he would choose?

8. (a) Suppose there is a constant-cost competitive industry with identical firms. Analyse the long-run effects on market price and each firm's output if the government imposes a per-unit output tax. How would your answer differ if it was
- i. an increasing-cost industry?
 - ii. a decreasing-cost industry?
- (b) Again assuming a constant-cost industry, suppose that the per-unit tax is abolished and instead every active firm must pay a lump-sum tax. The lump-sum tax is set to leave the long-run equilibrium price the same as it was under the per-unit tax scheme. Does the lump-sum tax yield more tax revenue?
9. Consider the following production functions:
- i. $Q = \min(\alpha L, \beta K)$,
 - ii. $Q = L^\alpha K^\beta$,
 - iii. $Q = \alpha L + \beta K$,
- where Q is the quantity of output per period of time, L and K are inputs of labour and capital per period of time and $0 < \alpha, \beta < 1$.
- (a) Explain the returns-to-a-factor characteristics of each production function.
 - (b) Define the marginal rate of substitution of labour for capital and express it mathematically for each production function. In each case, explain whether the factors are perfect substitutes, or perfect complements, or neither perfect substitutes nor perfect complements.
 - (c) Assume that $\alpha = \beta = \frac{1}{2}$. Let the cost of a unit of L be $w = 1$ and the cost of a unit of K be $r = 4$. Find the optimal capital-to-labour ratio for each of the production functions. How, if at all, will the optimal capital-to-labour ratio alter if $w = 4$ and $r = 1$?
 - (d) Assuming that $\alpha = \beta = \frac{1}{2}$, $w = 1$, and $r = 4$, derive the long-run average cost function for each production function.
10. (a) Explain how and in what circumstances markets would lead to a Pareto-efficient allocation of resources.
- (b) Why does the existence of public goods make it impossible or unlikely that markets would lead to a Pareto-efficient allocation of resources?

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11. (a) Define and explain the following concepts:
- i. expected value,
 - ii. expected utility,
 - iii. risk preferences,
 - iv. certainty equivalent.
- (b) Given the utility function $U = W^{\frac{1}{2}}$ and initial wealth $W = 34$, would Susan accept a gamble in which she wins 15 with probability $\frac{1}{2}$ or loses 9 with probability $\frac{1}{2}$? What initial value of wealth would make Susan indifferent between accepting the gamble and not accepting the gamble?
- (c) Peter has the utility function $U = W^{\frac{1}{2}}$ and initial wealth $W = 100$. He faces the risk of a loss of 36 with probability $\frac{1}{2}$. If Peter is offered actuarially fair insurance, will he buy full insurance? What is the maximum he will be prepared to pay for full insurance?
- (d) With the same utility function and initial wealth as described in (c), suppose that, for 100, Peter can buy an asset that will yield 10,000 with probability $\frac{1}{20}$ and 0 with probability $\frac{19}{20}$. Show that Peter will not buy this asset on his own but will join a syndicate with 10 equal partners.
12. A homogeneous products duopoly faces a market demand function given by $P = 300 - Q$, where $Q = Q_1 + Q_2$. Both firms have a constant marginal cost $MC = 30$.
- (a) What is the Cournot equilibrium quantity and price in this market?
 - (b) What is the Bertrand equilibrium price and quantity in this market?
 - (c) What would be the equilibrium price and quantity in this market if firms in the market acted as a profit-maximising cartel and divided quantity and profits equally among themselves?
 - (d) Explain the different outcomes in (a), (b) and (c).
 - (e) Suppose there is a set-up cost to enter the market so that the fixed cost (set-up cost multiplied by the interest rate) is 5000. Would a third firm enter any of the markets described in (a), (b) or (c) given the behaviour posited in each case?
13. Examine the positive and normative effects of asymmetric information on the operation of insurance markets.

14. (a) Defining all relevant terms, outline a simple two-period model in which individuals lend or borrow in order to maximise their 'lifetime' utility.
- (b) Assume that the rate of interest is 5 per cent and it is known that if the current period income increased by £100 an individual would increase current consumption by £70. What will be the effect on the same individual's current consumption if, instead of an increase in current period income of £100, the individual expects an increase in next period income of £105? What will be the effect on the individual's consumption in the next period?
- (c) Given the interest rate of 5 per cent, it is known that an individual would consume more than his income in the current period. Can we predict whether this individual would consume more than his income in the current period if, instead, the interest rate was 10 per cent?

END OF PAPER

