ECONOMICS TRIPOS PART I

Monday 13 June 2005 9-12

Paper 1

MICROECONOMICS

*Attempt **six** questions only from Section A, and **two** questions only from Section B.*

Section A and B will each carry 50% of the total marks for this paper.

STATIONERY REQUIREMENTS
20 Page Booklet x 1
Rough Work Pad x 1
Tags

SPECIAL REQUIREMENTS
Approved calculators allowed

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator

SECTION A

1 Suppose that there is a society in which there are *n* agents, and in which agent 1 has a utility function $u_1(u_2, u_3, ...u_n)$, where u_i is the utility level of agent $i\,(i = 2,..., n)$. Suppose that $u_1(u_2, u_3, ...u_n)$ decreases if any of its arguments increases. Agent 1, therefore, only cares about how much utility the other agents get, and prefers them to have lower utility. In this society, which allocations are Pareto-efficient?

2 There are two consumers, with incomes x_1 and x_2 respectively. Consumer 1's utility function is

$$u(x_1, x_2) = x_1 - \max(x_2 - x_1, 0).$$

Sketch this consumer's indifference curves.

3 "A natural monopoly should operate at the point at which price equals marginal cost." Comment.

4 "In industry equilibrium, it can happen that some firms make positive profits and others make negative profits." Comment.

5 "Competitive markets are necessary and sufficient for Pareto-efficiency." Comment.

6 "The free-rider problem implies that taxation is necessary for efficient supply of a public good, but it also obstructs the use of taxation." Comment.

7 Suppose that there are two goods. A consumer has monotonic preferences. Can both goods be Giffen goods for her? Explain.

8 A consumer buys pizzas (p) and burritos (b). Her utility function is $u(p,b) = p^{0.5}b^{0.5}$. The price of a pizza is 10 and the price of a burrito is 5. Her optimal quantity of pizzas is 4.

(a) What is her income?
(b) How many burritos does she consume?

9 Discuss, using examples, whether the existence of a dominant strategy equilibrium is necessary and/or sufficient for the existence of a Nash equilibrium.

10 Find the pure strategy Nash Equilibria of the following two games. In each case, which strategies will a rational player definitely not play?

(a)

	A_2	B_2	C_2
A_1	*4,2*	*3,0*	*-4,1*
B_1	*1,1*	*1,3*	*3,0*
C_1	*3,-1*	*2,2*	*1,-2*

(b)

	L	*C*	*R*
T	*2,4*	*1,0*	*3,1*
M	*-1,-1*	*4,2*	*2,0*
B	*1,1*	*0,4*	*-1,0*

SECTION B

11 To what extent is repetition necessary for achieving efficiency in 2x2 games (a) in theory, and (b) in experiments?

12

(a) Consider a perfectly competitive labour market. Each worker has one unit of time to devote to work and/or leisure. There is a single consumption good. The worker's utility function is

$$u(h,c) = h + \ln c$$

where h is number of units of leisure and c is consumption of the good. The price of the good is 1. The wage is w per unit of labour supplied. The worker's non-labour income is M.

(i) Derive the worker's labour supply function.

(ii) Find aggregate labour supply if there are 10 workers, 5 of whom have $M=3$ and 5 of whom have $M=0$. If aggregate labour demand is $L^D(w) = 20/w$, find the equilibrium wage.

(b) "The labour supply of a rational individual increases if the wage rises." Discuss.

13 Consider a perfectly competitive industry in which a fixed production process emits a pollutant which generates negative externalities for a very large number of individuals.

(a) Discuss the use of taxation on the output of the industry as a means of improving economic efficiency. Who bears the cost of the remaining pollution?

(b) Now suppose that the production process is not fixed and that reduction in pollution per unit of output can be achieved at a rising marginal cost. Discuss the use of tradable emission permits as a means of improving economic efficiency.

14 A monopolist sells its product in two markets. In each market the demand function is linear. P, the price, is related to y, the output, as follows:

$$P(y) = a - by,$$

where a is 20 in market 1 and 16 in market 2, while b is 2 in market 1 and 1 in market 2. The total cost of producing q units is $4q$.

(a) Assuming that the monopolist can charge different prices in the two markets, find the profit-maximizing prices and quantities in each market. Calculate the price-elasticity of demand in each market and the total profit.

(b) Explain what it is that determines which market has the higher price, and why.

(c) Now suppose that the price in one market must be equal to the price in the other market. Find the profit-maximizing optimal price and quantity in each market. What is the firm's profit?

15

(a) Examine critically the justification for redistributive taxes and subsidies, assuming that the premises of the Second Fundamental Theorem of Welfare Economics are true. To what extent is redistribution a public good?

(b) Explain why the premises of the Second Fundamental Theorem may not be true and discuss whether this invalidates the justification for redistributive taxes and subsidies.

16 Suppose that the government imposes a tax on petrol but also gives a tax rebate. The tax rebate that a consumer receives depends only on the average petrol consumption of all consumers. Would you expect this tax-and-rebate policy to change the consumption of petrol? Justify your answer.

END OF PAPER