ECONOMICS TRIPOS PART I

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Monday 12 June 2006   9-12

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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   SPECIAL REQUIREMENTS
20 Page Booklet x 1   *Approved calculators allowed*
Rough Work Pad x 1
Tags

SECTION A

Answer **six** questions

1   In a typical day in the Michaelmas term, Dr. Smith has 16 hours to allocate between research and leisure (he spends the other 8 hours teaching). In the Lent term, however, the teaching load is lighter, so that Dr. Smith has 20 hours a day to allocate between research and leisure. Do you expect Dr. Smith to spend more time in research in the Lent term? Explain your answer.

2   Suppose there are two consumers, 1 and 2. Let x_1 and x_2 denote the incomes of consumer 1 and consumer 2, respectively. Suppose consumer 1's utility function is

$$u_1(x_1, x_2) = x_1 - \alpha \max\{x_1 - x_2, 0\},$$

where $0 < \alpha < 1$, and consumer 2's utility function is $u_2(x_1, x_2) = x_2$. Suppose $x_1 = 10$, and $x_2 = 1$. How much money is consumer 1 willing to give to consumer 2?

3   John's parents give him £60 allowance per week. John allocates the money between books and other things. John has a utility function $u(B, X) = BX^2$, where B is the number of books purchased, each of which costs £1, and X is the money spent on other things. John's grandparents want to encourage him to read more. They promise John that for every pound he spends on books, he will receive 50p from them as a subsidy. Taking this into account, how many books does John buy per week?

4   'If a competitive firm exhibits constant returns to scale, then its long-run maximum profits must be zero'.   Discuss.

5   Under what circumstances would it be socially desirable to allow a natural monopoly to maximise its profits?

6   The demand curve facing a monopolist is given by $D(p) = 16/p^2$, where p is the price and $D(p)$ is annual demand. The monopolist has annual fixed costs of 2 and constant variable costs of 1 per unit. Determine the profit maximising output, price and profit. If variable costs are taxed, at what tax rate will the monopolist close down?

7   Two consumers Alan and Betty have the same utility functions $u(x,y) = x^{1/4}y^{1/4}$ but while Alan has an endowment of (1, 15) (i.e. Alan has 1 unit of x and 15 units of y), Betty has an endowment of (15, 1). Sketch the set of Pareto improving trades available to Alan and Betty. Show that if they agree to trade 1 unit of x for 1 unit of y, they will reach an efficient outcome.

8   'The fundamental theorems of welfare economics demonstrate that equity is compatible with efficiency.' Comment.

9   Once property rights are assigned, asymmetric information remains as the ultimate constraint on efficient solutions where externalities exist. Comment.

10   Define the payoffs to a 2 x 2 game as follows (where $A_i \neq B_i \neq C_i \neq D_i$)

	Left	*Right*
Up	A_1, A_2	B_1, B_2
Down	C_1, C_2	D_1, D_2

(a) What conditions on the payoffs have to hold for (Down,Right) to be a Nash Equilibrium?

(b) What conditions on the payoffs have to hold for (Down,Right) to be the unique Nash Equilibrium?

(c) What conditions on the payoffs have to hold for there to be no Nash Equilibrium?

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SECTION B

Answer **two** questions

11   Suppose a person's utility for leisure (R) and consumption (C) can be expressed as $u(R,C)=R^{0.5} + C$. Suppose that the person has 24 hours per day to allocate between work and leisure. Let w denote the person's hourly wage.

      (a)   Derive the person's labour supply curve.

      (b)   Now suppose there is an income tax. What happens to the person's labour supply curve when the income tax is cut from 70% to 30%?

      (c)   What happens to the person's labour supply curve when the person wins a lottery prize of 100 pounds per day?

12   (a)   Show that a road toll can increase the efficiency with which a congested limited-access motorway is used, when considered in isolation.

      (b)   Give an example to illustrate how a more comprehensive analysis of the effects of a road toll could reverse the direction of welfare change described in (a).

      (c)   Discuss more generally whether user charges, where they are feasible, are an equitable method to finance publicly-provided goods.

13   An industry is studied by an economist who concludes that all firms appear to be operating at less than the efficient scale of production but they are earning only normal profits.

      (a)   Under what conditions is there a well-defined efficient scale of operation?

      (b)   What conditions would be required for the industry as observed to be in long-run equilibrium?

      (c)   What might be the short and long run effects of a significant and uniform increase in industry demand?

      (d)   Suppose that each firm's average costs continue to decrease with increasing output. Under what conditions could there be a long-run equilibrium for this industry with many different firms each only earning normal profits?

14   (a)   Specify the marginal efficiency conditions that characterise Pareto-efficiency in an economy with production and exchange.

      (b)   Explain for each condition why its violation gives scope for a Pareto improvement.

      (c)   Describe the role of perfectly competitive markets in the attainment of Pareto-efficiency.

15   A competitive economy of identical consumers has (inverse) market demand schedules for two of its goods $i = 1, 2$, given by

$$p_i = a_i - b_i Q_i, \quad i = 1, 2,$$

where p_i is the price for good i (in £/unit), and Q_i is the demand for good i at that price. Initially, only these two goods are subject to an excise tax, and the revenue is used to finance a public good that is equally valued by all consumers. The unit cost of production of both goods is constant and equal to c.

(a)   In the first case, $a_1 = £18$, $a_2 = £14$, $b_1 = b_2 = 1$, $c = £4$, and the excise tax is the same for both goods at £t per unit, with $t = 2$. Find the market clearing (competitive) price, total tax revenue and the money value of the total consumers' surplus from the consumption of these two goods.

(b)   The tax rate is now doubled for good 1, and reduced to zero for good 2. What effect does this have on the total tax revenue and consumers' surplus and their sum? Comment on the desirability of this tax reform.

(c)   Is it always true (as the values of the parameters a_i and b_i vary) that collecting all the tax by a tax on one good is worse than placing an equal tax on both goods? If not, what factors are relevant for the choice of tax rate?

16   Give an example where competition over rents implies an efficiency loss and show that inefficiency is a Nash Equilibrium. What might be done to reduce this inefficiency? To what extent can an auction be designed to solve this problem?

END OF PAPER