V/C31.0010.002. Fall 1999

Intermediate Microeconomics Sample Final

Points 110. Time 110 minutes (2.00–3.50pm).

Guide for Time Allocation: The questions in part (1) should take no more than 5 minutes each to answer. The questions in part (2) should take you no more than 10 minutes each. This schedule will allow you to finish the exam in 110 minutes. Good luck.

(1) (**50 points, 5 points per part**) Are the following statements true or false? A simple yes-no answer will *not* suffice. Explain, with the use of diagrams where necessary.

[**a**] In an Edgeworth box, you *never* need to know individual endowments to find the locus of *all* Pareto-optimal allocations.

[**b**] A third-degree discriminating monopolist charges prices that are directly proportional to the elasticity of demand.

[**c**] Price discrimination can sometimes result in the same quantity being produced as under a competitive equilibrium.

[**d**] When marginal revenue falls (with expanding output), we must be in the inelastic section of the demand curve.

[**e**] For a borrower, an increase in the interest rate must reduce borrowing, provided consumption in all dates is normal.

[**f**] Under monopolistic competition with free entry, the outcome always involves excessive variety in production.

[**g**] When two goods are perfect substitutes in consumption, a consumer will *never* consume both goods except for *one* relative price ratio.

[**h**] If a machine pays off \$10 more next year but \$10 less the year after, its *present value* must stay unchanged.

[**i**] An *increase* in the wage rate must *increase* labor supply if leisure is an inferior good.

[**j**] If *every* pair of commodity bundles can be (pairwise) ranked, then preferences must be transitive.

(2) (**60 points, 10 points per part**) Answer the following questions briefly and clearly. You can put in a diagram, and/or a simple example to illustrate. *These are not true-false questions.*

(i) (a) Consider an allocation of two goods in the economy in which the marginal rate of substitution between goods A and B is the same for all persons, but the marginal rate of transformation in production is different. Show how you would go about creating a Pareto-improvement. (b) Repeat this exercise for the case in which the marginal rate of substitution is different between two persons.

(ii) Describe Pareto-optimal allocations in each of the following cases: (a) two goods in *given* quantities, A and B. Individual 1 likes only A and individual 1 likes only B; (b) same as in part (a), except that the mix of A and B can be altered by moving along a production possibility frontier; (c) same as in part (c) except that both individuals 1 and 2 like A and both are indifferent to B.

(iii) Show, using an Edgeworth Box, how a competitive price system picks out a point on the contract curve and thus yields Pareto-optimality. You may assume that the two goods are given in fixed supply. Do you think that starting from the *same* endowments, *two* different competitive equilibria might exist?

(iv) A monopolist sells shoes at zero marginal cost. The demand curve for shoes is given by $P = 18 - x$, where p is price and x is quantity. What price will the monopolist charge? What price would the competitive market have charged, if all firms had the same marginal cost curve and there were free entry?

(v) In (K, L) space, draw isoquants for the following production functions, with explanatory markers where necessary: (a) production is fully automated — more capital produces more output but labor is useless in production; (b) $X = K^{0.8}L^{0.8}$ (warning: this exhibits increasing returns to scale); (c) capital and labor must be used in the proportion $3 : 1$ to produce each unit of output; (d) capital is a perfect substitute for labor until ten units of capital are reached — thereafter capital is useless in production.

(vi) Show that there cannot be Giffen inputs — when the price of an input goes up, the demand for that input (by a proit-maximizing firm) must fall.