

Micro II Final, December 12, 2007

You have until 3:00 to complete this exam. Answer all five questions. You may use results covered in class, the textbook, or your homework to answer the questions. To insure maximum credit, be sure to explain your answers. Each question is worth 30 points, for a total of 150 points. The problems are not equally hard. Good luck!

1. A lottery pays \$10 with probability .1 and \$0 with probability .9. The consumer's utility function is $u(c) = c^\eta$ where $0 < \eta < 1$.
 - a) Compute the certainty equivalent of this lottery as a function of η .
 - b) What happens to the certainty equivalent as $\eta \rightarrow 1$?
 - c) What happens to the certainty equivalent as $\eta \rightarrow 0$?
2. Consider a two-person, two-good exchange economy. Consumer 1 has endowment (4, 2) and utility $u_1(x_1, x_2) = x_1 + x_2$. Consumer 2 has endowment (1, 3) and utility $u_2(x_1, x_2) = \ln x_1 + 2 \ln x_2$.
 - a) Find all Pareto optima.
 - b) Find the core.
 - c) Find all Walrasian equilibria.
3. Suppose a firm's production set is given by $Y = \{(-z, q) : z \geq 0, q \leq z^{1/3}\}$.
 - a) Find the profit-maximizing net output vector.
 - b) Derive the profit function $\pi(p_z, p_q)$.
 - c) Does the technology exhibit constant returns to scale? Increasing returns to scale? Decreasing returns to scale?
4. Consider a two-agent, two-good economy production economy where utility is $u_1(x_1, x_2) = (x_1)^{1/2}(x_2)^{1/2}$ and $u_2(x_1, x_2) = (x_1)^{1/3}(x_2)^{2/3}$. Endowments are $\omega^1 = (3, 0)$ and $\omega^2 = (6, 0)$. There is one firm with production set $Y = \{(y_1, y_2) : y_1 \leq 0, y_2 \leq -y_1\}$. Find the equilibrium prices, equilibrium demands by individuals, and the firm's equilibrium net output.
5. Consider an exchange economy with 2 consumers, 2 goods, and 2 states of the world. Let $x_{s\ell}^i$ denote consumer i 's consumption of good ℓ in state s . Each consumer has utility function

$$u(x^i) = \frac{1}{2} \left[(x_{11}^i x_{12}^i)^{1/2} + (x_{21}^i x_{22}^i)^{1/2} \right].$$

Consumer 1's endowment is $\omega^1 = ((1, 2), (2, 1))$. Consumer 2's endowment is $\omega^2 = ((2, 1), (1, 2))$. There are two assets with return matrix

$$R = \begin{pmatrix} 1 & .5 \\ .5 & .25 \end{pmatrix}.$$

- a) Is there a complete set of assets?
- b) Find a Radner equilibrium.
- c) Is the Radner equilibrium you found Pareto optimal?