YORK UNIVERSITY Faculty of Graduate Studies

Final Examination December 12, 2013

Economics 5010 BF3.0 : Applied Microeconomics S. Bucovetsky

time=2.5 hours

Do any **6** of the following 10 questions. All count equally.

1. Prove that the Hicksian (compensated) demand function for a good must be a decreasing function of the good's price.

2. Suppose that a person was a von Neumann–Morgenstern expected utility maximizer, with utility–of–wealth function

$$U(W) = \log W$$

How much insurance would the person buy against a monetary loss of L, if the person had an initial wealth of W, and expected to suffer the loss with probability π, if insurance coverage cost p dollars for each dollar of insurance coverage (with $p \geq \pi$)?

3. What is the cost function, and what are the conditional input demand functions, for a firm with a production function

$$f(x_1, x_2) = \sqrt{x_1} + \sqrt{x_2} \qquad ?$$

4. Is it possible that the long–run supply curve for a competitive industry has negatively–sloped segments? Explain briefly.

continued

5. What are the Cournot–Nash equilibria when there are two identical firms in an industry, producing the same homogeneous good, with aggregate demand function

$$Q = A - p$$

(where Q is aggregate quantity demanded, and p the price), if each firm's total cost of producing q units were

$$TC(q) = cq + F \qquad \text{if} \quad q > 0$$

$$TC(0) = 0$$

with $c > 0$, $F > 0$?

6. Is the allocation $\mathbf{x}^1 = (12, 0), \mathbf{x}^2 = (0, 6), \mathbf{x}^3 = (3, 9)$ in the core of the 3–person exchange economy described below? Explain why or why not.

Each person has the same endowment vector $\mathbf{e}^i = (5, 5)$. Person 1's preferences can be represented by the utility function $U^1(x_1^1, x_2^1) = x_1^1$, person 2's by the utility function $U^2(x_1^2, x_2^2) = x_2^2$, and person 3's by the utility function $U^3(x_1^3, x_2^3) = x_1^3 x_2^3$.

7. There are n people in an exchange economy, each of them with the same preferences, which can be represented by the utility function

$$U^i(x_1^i, x_2^i) = x_1^i + \log(x_2^i)$$

Person i has an endowment vector (e_1^i, e_2^i), where the endowments may differ among different people, but where $e_1^i > 1$ for each person i.

How would an increase in person j's endowment of good 2, e_2^j, affect the Walrasian (competitive) equilibrium allocation in this economy?

continued

8. What are all the Nash equilibria (in pure and mixed strategies) to the following game in strategic form?

	a	b	c	d
I	$(2, 10)$	$(4, 12)$	$(6, 0)$	$(5, 12)$
II	$(1, 3)$	$(6, 6)$	$(6, 4)$	$(5, 4)$
III	$(5, 4)$	$(6, 8)$	$(10, 12)$	$(4, 6)$
IV	$(0, 5)$	$(6, 8)$	$(8, 8)$	$(12, 10)$

9. Show that there is a sequential equilibrium in which some workers choose to be educated, in a model with (all) the following features : education has no effect on a worker's productivity ; education is more costly to unskilled workers than skilled workers ; each worker knows whether he or she is skilled or unskilled ; firms cannot observe directly a worker's skill level ; education choices are made by workers before firms make hiring decisions.

10. What is the expected revenue from an "English" (oral, ascending bid) auction, with no reserve bid, if there are three bidders for the object, and if each bidder's value for the object is an independent draw from the $U[0, 1]$ distribution? (That is, the value for each bidder is uniformly distributed over $[0, 1]$.)