OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

WW FACULTY OF ECONOMICS AND MANAGEMENT

Microeconomic Analysis

(20024)

Examination Summer Term 2013

Examiner:	Prof. Dr. Andreas Knabe
Date:	15.07.2013
The following aids may be used:	Non-programmable pocket calculators Bilingual English language dictionaries without individual entries or marking
Time:	120 minutes

Including the front page this exam contains 3 pages with 3 questions. The total amount of points to be obtained is 45. When a written explanation is asked for, please answer in short, but complete sentences and **not** just in catchwords. Remember that you should carefully explain all elements when providing graphical illustrations.

Good luck!

Question 1: Topics in Consumer Theory - Uncertainty (15 points)

a) Utility functions possessing the expected utility property are called "Von-Neumann-Morgenstern" utility functions. Please describe this property.

2 points

b) Which axioms (axioms of choice under uncertainty) need to be fulfilled so that there always exists a utility function $u: G \rightarrow \mathbb{R}$ representing $\succsim$ on G, such that u has the expected utility property. Please explain each axiom briefly in your own words.

6 points

c) When is a decision maker said to be risk averse/risk neutral/risk loving? Please explain using three diagrams as well as mathematical notion. What can you say about the sign of the risk premium for risk averse/risk neutral/risk loving decision makers? Please give a brief economic intuition.

7 points

Question 2: Theory of the Firm (15 points)

Assume a firm possesses the following production function: $f(x_1, x_2) = (x_1 - c)^{\alpha}(x_2 - d)^{\beta}$.

a) Calculate the firm's input demands $x_1(\boldsymbol{p}, \boldsymbol{w})$ and $x_2(\boldsymbol{p}, \boldsymbol{w})$ and its supply function.

8 points

b) You are given following cost function

$$C(\boldsymbol{w}, y) = y^{\frac{1}{\alpha+\beta}} \cdot (\alpha + \beta) \cdot \left(\frac{w_1}{\alpha}\right)^{\frac{\alpha}{\alpha+\beta}} \cdot \left(\frac{w_2}{\beta}\right)^{\frac{\beta}{\alpha+\beta}} + w_1 \cdot c + w_2 \cdot d$$

Derive the conditional input demands.

3 points

c) Assume that *f* is a strictly concave production function satisfying continuity, strong monotonicity and strict quasiconcavity (and *f*(0)=0) and its associated profit function, π(**p**,y), is twice continuously differentiable.

Please, write down the substitution matrix.

Prove that for all p>0 and **w**≫0 where the production function is well defined $\frac{\partial y(p,\boldsymbol{w})}{\partial w_i} = -\frac{\partial x_i(p,\boldsymbol{w})}{\partial p}$ holds.

4 points

Question 3: General Equilibrium (15 points)

a) Prove that if for each consumer i, u^i satisfies continuity and strict quasiconcavity and is strongly increasing, then for all $\boldsymbol{p} \gg 0$, $\boldsymbol{p} \cdot z(\boldsymbol{p}) = 0$ (Walras' law is fulfilled).

3 points

b) Assume that in a two-person economy both consumers have identical utility functions, $u^i(x_1^i, x_2^i) = \left({x_1^i}^\rho + {x_2^i}^\rho\right)^{1/\rho}$, $i = 1,2$. Both individuals are initially endowed with quantities e_1^i and e_2^i.
Please, calculate the excess demand functions for both goods. Is Walras' law fulfilled?

8 points

c) Are the following sets of demand functions legitimate excess demand functions for $\boldsymbol{p} \gg 0$? Please explain why or why not.

i.
$$\left.\begin{aligned} z_1(\boldsymbol{p}) &= \frac{p_2+p_3}{{p_1}^2-1} \\ z_2(\boldsymbol{p}) &= \frac{p_1+p_3}{{p_2}^2-1} \\ z_3(\boldsymbol{p}) &= \frac{p_1+p_2}{{p_3}^2-1} \end{aligned}\right\}$$

ii.
$$\left.\begin{aligned} z_1(\boldsymbol{p}) &= \frac{p_3}{p_1} \\ z_2(\boldsymbol{p}) &= \frac{p_3}{p_2} \\ z_3(\boldsymbol{p}) &= -4 \end{aligned}\right\}$$

4 points