Otto von Guericke Universität Magdeburg
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20385 Population and Family Economics
Summer 2012

Part I: /10

Part II: /70

Total: /80

Grade:

Student ID: ....

Family name: ....

First name: ....

Important notes and instructions

This is a **120 minutes** examination which consists of **two parts**.

Both parts (I and II) have to be answered. Maximum points possible: 80 points.

Check, if you have all **five problem sheets (ten pages)**. Read the instructions to Part I and Part II.

Write your name and student ID number on this cover sheet. In case you also use separate double sheets for your answers, write your name on all answer sheets. Write legibly!

Allowed auxiliary materials: Dictionary

Good luck!

4. A household public good z is produced using as inputs purchased goods x and time t spent in household production: $z = f(x, t)$. Which of the following household production functions f exhibits constant returns to scale?

☐ $f(x, t) = \frac{x}{t}$

☐ $f(x, t) = xt$

☐ $f(x, t) = \sqrt{xt}$

5. Assume there is only one good, a household public good denoted by y. Under singlehood, individuals i and j derive utility $u[y_i]$ and $v[y_j]$. Levels of y_i and y_j are exogenously fixed and constant. What would be their respective individual utilities if they marry and join resources?

☐ $\gamma u[y_i + y_j]$ and $(1 - \gamma)v[y_i + y_j]$, with $\gamma \in [0, 1]$

☐ $u[y_i + y_j]$ and $v[y_i + y_j]$

☐ $u[\gamma(y_i + y_j)]$ and $v[(1 - \gamma)(y_i + y_j)]$, with $\gamma \in [0, 1]$

6. A potential gain to individuals from marriage that arises from risk sharing is that for constant values of expected individual income levels...

☐ ...expected utility decreases.

☐ ...expected utility remains unchanged.

☐ ...expected utility increases.

7. In lecture, we studied a microeconomic foundation for the institution of marriage. Which of the following statements about the underlying paper (Bethmann and Kvasnicka, 2011) is <u>wrong</u>?

☐ The paper takes explicitly into account biological asymmetries between the two sexes.

☐ The paper shows that a general increase in the cost of mating can mitigate mating market failure.

☐ The paper argues that marriage as an institution helps to achieve the first best equilibrium.

Part II:

Instructions: Answer **five** of the following six questions. If more than five questions are answered, only the first five will be graded. A maximum of **70 points** is attainable.

1 Fertility

Consider the following version of a Malthusian household. Parental preferences are described by a unitary household utility function:

$$U(c, s) \tag{1.1}$$

with the following properties $U_{cc}, U_{ss} < 0 < U_c, U_s$. The household's lifetime budget constraint is given by:

$$I = \pi_c c + s \tag{1.2}$$

1a Briefly describe the model's equations (variables and parameters) in your own words. **(2 points)**

1b Define the Lagrangian function $\mathcal{L}(c, s, \lambda)$ and determine the household's optimal decisions. **(4 points)**

1c Determine the marginal rate of substitution between c and s. Interpret your result. **(2 points)**

1d Show that the total differential of the first order conditions is given by the following equation:

$$\begin{bmatrix} U_{cc} & U_{cs} & -\pi_c \\ U_{cs} & U_{ss} & -1 \\ \pi_c & 1 & 0 \end{bmatrix} \begin{bmatrix} dc \\ ds \\ d\lambda \end{bmatrix} = \begin{bmatrix} \lambda & 0 \\ 0 & 0 \\ -c & 1 \end{bmatrix} \begin{bmatrix} d\pi_c \\ dI \end{bmatrix}$$

(2 points)

1e Assume that $U_{cs} = 0$ holds and show the effect of a change of I on c. Discuss your result. **(4 points)**

3 The Institution of Marriage

Consider the paper by Bethmann and Kvasnicka (2011) discussed in lecture.

$$W_\female\left(K_\female, Q\right) = U\left(Y_\female - s_\female N_\female - a_\female K_\female Q_\female\right) + V\left(K_\female, Q\right) \tag{3.1}$$

$$W_\male\left(K_\male, Q\right) = U\left(Y_\male - s_\male N_\male - a_\male N_\male q_\male\right) + \mathbb{E}\left[V\left(K_\male, Q\right)\right] \tag{3.2}$$

$$Q = \left[\alpha Q_\female^{\frac{\eta-1}{\eta}} + (1 - \alpha)Q_\male^{\frac{\eta-1}{\eta}}\right]^{\frac{\eta}{\eta-1}} \tag{3.3}$$

$$Q_\male = \sum_{i=1}^{N_\female} q_\male^{(i)} = N_\female q_\male \tag{3.4}$$

$$\frac{N_\female}{N_\male} = \phi \tag{3.5}$$

$$s = s_\female + s_\male \tag{3.6}$$

3a Briefly describe the model's equations (variables and parameters) in your own words. **(5 points)**

3b Briefly describe the optimal female and male reproductive strategies. **(4 points)**

3c Why do the reproductive strategies lead to market failure? **(3 points)**

3d How can this market failure be mitigated? **(2 points)**

7

5 Economics of Divorce

Descriptive statistics suggest that divorce is harmful for women.

5a Briefly describe the potential identification problem encountered when giving this descriptive evidence a causal interpretation. (**4 points**)

5b Which empirical strategy do Bedard and Deschênes (2005) use to overcome this potential identification problem? (**4 points**)

5c What are Bedard and Deschênes' main findings? (**2 points**)

5d Briefly describe an alternative strategy that may be used to overcome the identification problem. (**4 points**)