Exercise List 2 - Microeconomics II

Problem 1

Part a)

If $n > n_H + n_L$, $p_L = u_L$, $p_H = u_H$. If $n < n_H + n_L$, $p_L = c_L$, $p_H = c_H$ with $n < n_H, n < n_L$. Otherwise, tie-breaking rule is necessary and potentially no equilibrium in pure strategy.

Part b)

If $\bar{u} > c_H$, then the equilibrium prices are $p \in [c_H, \bar{u}]$ and $p = u_L$. If $\bar{u} < c_H$, then the equilibrium price is $p = u_L$.

Problem 2

Part a)

The average quality: $\bar{x}(p) = 0$ $p < 2$ and $\bar{x}(p) = \frac{2+p}{2}$ if $p \geq 2$. The supply: $S(p) = 0$ $p < 2$, $S(p) = \frac{p-2}{4}$ if $6 \geq p \geq 2$ and $S(p) = 1$ if $p > 6$.

Part b)

Equilibrium price $p = 3$.

Problem 3

Part a)

$p = 0.8 - 0.3\lambda$. Type L prefers the contact iff $\lambda \geq \frac{1}{6}$. Type H always prefers the contact.

Part b)

Contract for the type H: $I_H = 1$ and $p_H = \frac{4}{5}$. Contract for type L: $I_L \approx 0.2$ and $p_L \approx 0.1$.

Problem 4

$x_A = \alpha$, $x_B = \omega_x - \alpha$, $y_A, y_B \in (0, \omega_y)^2 : y_A + y_B = \omega_y$.

Problem 5

Part a)

Efficient level of pollution: $x = 10$. The range of bargains the two firms could be expected to reach: $[200, 800]$.

Part b)

Efficient level of pollution: $x = 10$. Transfer from Chemco to de Beers: $T = 100$

Part c)

Free Riding problem: more difficult to reach an agreement.

Problem 6

Part a)

Marginal conditions for Pareto Optimality: $v_i'(x_i) = c + b\alpha$.

Part b)

Marginal conditions for Competitive Market: $v_i'(x_i) = c + b\alpha_i$.

Part c)

All families necessarily drive too much.

Problem 7

With equal division of the bill: $x^i = \frac{n\alpha^i}{p}$; with single division of the bill: $x^i = \frac{\alpha^i}{p}$.

Problem 8

Part a)

Mr. Beta's budget constraint: $40 = y_B + x$. Level of y_B and x chosen by Mr. Beta: $y_B = \frac{40}{1+\beta}$; $x = \frac{40\beta}{1+\beta}$.

Part b)

$y_A = 44$, $y_B = 33$, $x = s_A + s_B = 4 + 7 = 11$.

Part c)

Pareto Improvement: $y_A = 40$, $y_B = 30$, $x = 18$.

Part d)

On-the-constraint condition: $88 = y_A + y_B + x$. Marginal condition:

$$\alpha \frac{y_A}{x} + \beta \frac{y_B}{x} = 1.$$

Problem 9

Part a)

$x_i = 2$.

Part b)

No Pareto Optimal. Optimal number of cows: 125. Possible transfers to overcome the indivisibility of cows.