Final Exam

5.3.2015

1. General information:

a. Make sure that your final exam is complete. The final exam consists of 4 problems.
b. Only use the provided sheet of paper. Write your matriculation number immediately and clearly on each page!
c. Please do not remove the staples from the provided sheet of paper.
d. Allowed items at your workplace: Student ID, writing utensils (no red pen, no ink eraser, no pencil case), ruler, set square, non programmable calculator, food and drinks.
e. Use a permanent pen (no pencil).
f. Mobile phones have to be turned off and removed from your place!

2. Hints about doing the exam:

a. Read each task carefully. The tasks could be extended over several pages.
b. Please work on all tasks and state each on a new page. Please write your answers in a readable way.
c. You may write your answers in English or in German.
d. Label the axes of your illustrations.
e. The exam lasts 90 minutes!

We wish you every success!

Problem 1

Consider a homogenous goods market in which two firms compete. Market demand can be described by the function $q(p) = 100 - p$ where q and p denote quantities and the market price, respectively. The cost functions are of the form $C_i(q_i) = c_i \cdot q_i$.

a) Assume that both firms compete in quantities. Determine the profit maximization problem of the two firms and derive the equilibrium quantities and profits of both firms.

b) Consider now that one of the two firms can act as a Stackelberg-leader. Both firms now have identical, constant marginal costs of $c = 10$. Determine the equilibrium quantities and profits in this case.

c) Now consider the case in which one firm, the incumbent I, is already in the market. The entrant E can enter the market by incurring entry costs $F = 100$. In case of entry, the incumbent acts as a Stackelberg-leader. Determine the incumbent's output which is necessary to deter entry. Is it optimal for the incumbent to deter entry? Give a short, intuitive explanation on how the incumbent can deter entry.

Now assume that both firms are capacity constraint at $\bar{x}_1 = \bar{x}_2$ with $q_i \leq \bar{x}_i$. The efficient rationing rule applies. Marginal costs are identical and constant across both firms with $c = 10$.

d) Given $\bar{x}_1 = \bar{x}_2 = 25$, firm 1 charges a price $p_1 = 100 - \bar{x}_1 - \bar{x}_2$. Show that firm 2 has no incentive to charge a different price than firm 1. Interpret your results. Explain briefly what would happen if the capacities were $\bar{x}_1 = \bar{x}_2 = 45$.

Problem 2

In the beer market, there are two active producer. Reichl (firm 1) offers a high quality beer with quality $z_1 = 6$. Morkbacher (firm 2) produces a low quality alternative with quality $z_2 = 2$. Consumers' indirect utility can be described as $v_i^k = i \cdot z_k - p_k$, where k indicates the firm the consumers buys the product from and $i \in [1, 5.5]$ captures the consumers $i's$ perception of quality. Marginal costs are zero for both firms. Assume that the total Number of consumers is $N = 1000$.

a) Determine the indifferent consumers and interpret your results. Derive the demand functions for the two qualities.

b) Derive the profit maximization problem of the two firms and determine the equilibrium prices. Will the market be covered?

Problem 3

Consider a monopolist who faces an inverse demand of $P(Q, A) = 110 - 5Q + 2\sqrt{A}$. The total cost function can be described by $C(Q, A) = 10Q + A$.

a) Calculate the optimal output and advertising expenditure, optimal profits and consumer surplus.
b) What is the value of the advertising-to-sales-ratio in the profit maximum? Interpret your result.
c) Interpret the different functions of advertising. Explain the consequences for consumer surplus. (No more than 5 sentences) (7P)

Problem 4

Describe the different types of price discrimination. Focus on the monopoly case. Give examples of the different kinds of price discrimination and explain the problems that can arise for the monopolist when he tries to introduce discrimination.