**Four questions.** Maximum score is 70 points. Please provide answers (either in English or Swedish) that are short and to the point. Irrelevant text will reduce your score. Calculators do not help in this exam so they are not needed.

**Question 1.** Nash equilibrium and subgame perfect equilibrium are both widely used solution concepts in game theory. What is the main difference between these two solution concepts? Please use at **most three sentences** in your answer. You may want to check out Question 3 before answering to this question. (15points)

**Question 2.** Suppose that a CEO of a large corporation is explaining the firm's annual financial results in a press conference. The financial result for the last year is not very good and the CEO is saying that this was because of a "price war" with competitors. Please give **one reason** (and only one reason) for why the CEO should avoid using the term "price war" here. Please use at **most three sentences** in your answer. (15points)

**Question 3.** Consider a game between two auction houses Chris and Soth. The auction houses compete in setting commission rates for sellers. Assume for simplicity that each house can only set one of the two commission rates: 4% and 8%. The stage game is depicted below in Figure 1. In words, if both houses charge 4% and 8%, their profits are 0 and 6, respectively. If one house sets 4% but its rival sets 8%, then the house setting 4% captures the whole market and gets a very large profit of 9, whereas its rival (the house setting 8%) will receive no commissions and earns negative profits (-1).

FIGURE 1: Auction house game

| Chris | Soth | 4% | 8% |
|-------|------|--------|--------|
|       | 4%   | (0,0)  | (9,-1) |
|       | 8%   | (-1,9) | (6,6)  |

**Question 3a)** What is the unique Nash equilibrium of this stage game? 5p

**Question 3b)** Now consider an infinitely repeated version of the stage game where the auction houses have a common discount factor $\delta \in [0,1]$ and attempt to sustain a

collusion where their joint profits are maximized. To sustain such a collusion the houses use the grim-trigger strategy, i.e., the houses start by choosing the collusive action and continue to choose it unless there is a deviation in the previous period after which the houses revert to the stage game Nash-play for ever. Calculate the range of the discount factors where collusion can be sustained as a subgame-perfect equilibrium outcome. (15p)

**Question 4)** During the quest lectures, Frans Saxén and Pekka Sääskilahti emphasized the importance of estimating the firm's own price elasticity of demand. Please explain why estimating the firm's own price elasticity of demand is important by using **at most three sentences**. (20p)