

EC-366
Market Structure and Strategic Behaviour
Mid-Term Exam, 2010/2011.

The exam consists of one question. The time is one hour.

Question 1

Firm 1 and firm 2 choose whether to charge either a high price $p = 10$ or a low price $p = 5$. If both firms charge a high price they obtain a payoff of 20 each. If both firms charge a low price they obtain a payoff of 5 each. If one firm charges a high price and the other charges a low price, the high price firm obtains a profit of 2 and the low price firm obtains a profit of 15.

- 1 Suppose firms play a one-shot game in which they choose the price to charge.
 - 1.1 [8 points] Represent the game as a normal-form game;
 - 1.2 [7 points] Define the set of action profiles of this game;
 - 1.3 [10 points] Find the pure strategy Nash equilibrium of this game.
- 2 Now, suppose that firms play the stage game above for a finite number of periods T . The payoff of each firm at the end of the game is given by the sum of per-period payoffs discounted by a discount factor of $\delta \in (0, 1)$.
 - 2.1 [10 points] Define the set of strategy profiles.
 - 2.2 [15 points] Find the pure strategy subgame perfect Nash equilibrium
- 3 Now, suppose that firms play the stage game above for an infinite number of periods. The payoff of each firm at the end of the game is given by the sum of per-period payoffs discounted by a discount factor of $\delta \in (0, 1)$.
 - 3.1 [20 points] Define formally a trigger strategy under which the two firms charge high prices in every period if they do not deviate.
 - 3.2 [30 points] Show for which range of discount factors the above trigger strategy can be supported as a subgame perfect equilibrium.