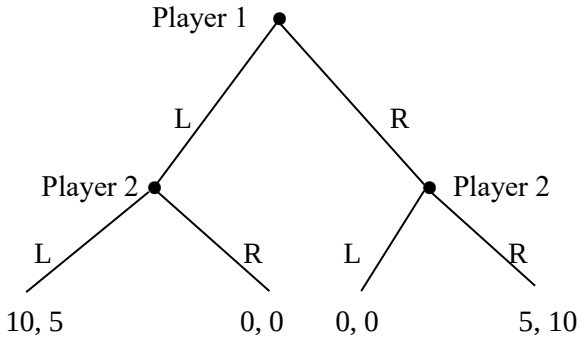
Test
Advanced Microeconomics: Part II (Uwe Jirjahn)

Winter 22/23

Choose two questions out of the three questions Q1, Q2, Q3.

Q.1 Consider the following extensive-form game:



Q.1.a Depict the corresponding normal form of the game.
Q.1.b Identify the Nash equilibria.
Q.1.c Identify the subgame-perfect Nash equilibrium by using backward induction.

Q.2 Two firms produce homogeneous products. The inverse demand function is given by: $p(x_1, x_2) = 2 - x_1 - x_2$, where x_1 is the quantity chosen by firm 1 and x_2 the quantity chosen simultaneously by firm 2. The cost function of firm 1 is $C_1(x_1) = x_1$. The cost function of firm 2 is $C_2(x_2) = c_2 x_2$. Nature chooses $c_2 = 0.5$ with probability 0.5 and $c_2 = 1.5$ with probability 0.5. While firm 2 observes nature's choice, firm 1 cannot observe that choice. Find the static Bayesian Nash equilibrium.

Q.3 Two firms (i = 1, 2) produce differentiated products. The demand function for the product of firm i is given by: $q_i(p_i, p_j) = 4 - p_i + \frac{1}{2}p_j$, where p_i is the price chosen by firm i and p_j the price chosen by its competitor. The firms choose their prices simultaneously. The cost function of each firm is $C_i(q_i) = 2q_i$.
Q.3.a Show the response functions graphically.
Q.3.b Find the Nash equilibrium.
Q.3.c Calculate each firm's equilibrium profit.

Note: If you answer all three questions, we will only consider Q.1 and Q.2.