UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Exam: **ECON3820/4820 – Strategic Competition**

Date of exam: Wednesday, May 30, 2018   **Grades are given: June 15, 2018**

Time for exam: 14.30 – 17.30

The problem set covers 2 pages

Resources allowed:
- No written or printed resources – or calculator - is allowed (except if you have been granted use of a dictionary from the Faculty of Social Sciences)

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

Please answer all four questions.

Question 1 – weight 25%
Consider an industry where there are two firms each with the same cost function $C_i(q_i) = cq_i$, where subscript i denotes firm $i = 1,2$, q_i is the quantity of firm i, and $c > 0$ is the unit cost of production. Firms know each other's costs. The inverse demand in the industry is $P(Q) = a - Q$, where $a > c$, and $Q = q_1 + q_2$. Firms compete by setting quantities simultaneously.
  (i)   Find firms' equilibrium quantities.
  (ii)   Discuss whether the equilibrium outcome in (i) can be understood as that of a two-stage game where firms choose their capacities in stage 1 and prices in stage 2.

Question 2 – weight 25%
Consider the same industry as in Question 1. But suppose now that firm 1, before the two firms compete in quantities, has a chance to make a costly investment that will lower its unit cost from c to $c - d$, where $0 < d < c$. Firms still know each other's costs.
  (i)   Show, in a graph of best-response curves, how this investment entails a shift of firm 1's best-response curve.
  (ii)   Discuss whether making this investment can be understood as a top-dog strategy of entry accommodation.

Question 3 – weight 25%
Consider the same industry as in Questions 1 and 2. Suppose now, in contrast to Question 2, that firm 2 does not know whether or not firm 1 has lowered its costs. This means that, while both firms know that firm 2's unit cost of production is c, firm 1 has private information on whether its unit cost of production is c or $c - d$.
  (i)   Discuss, with the help of a graph of best-response curves, the equilibrium outcome in this case.
  (ii)   What is the effect on the equilibrium outcome of firm 2 attaching a higher probability to firm 1 being low-cost?

Question 4 – weight 25%

    (i)   Discuss how the incentives for a firm to innovate depend on whether it is a monopolist or a competitive firm.

    (ii)   Explain briefly the following concepts:

        a. Double marginalization.

        b. Two-sided market.