

## Practice problem set 24

### Natural monopolies & regulation

This problem set constitutes recommended material for the relevant lab. The choice of tasks to be presented instructionally in every lab is in the discretion of the individual teacher. Students are expected to work on practice problems, however, are not required to submit written solutions. It is non-negotiable policy in this course to not provide hand-outs with the solutions of practice problem sets.

1. A natural monopolist has total cost  $C(Q) = 300 + 15Q$  and faces market demand  $Q = 200 - 2P$ . Derive the monopolist's output and profit and the consumer surplus when:
  - (a) price is set equal to marginal cost;
  - (b) price is set equal to average cost;
  - (c) there is two-part pricing and the monopolist chooses the tariff to maximize profit;
  - (d) there is two-part pricing and a regulator chooses the tariff to maximize consumer surplus. subject to the monopolist breaking even.

For parts (c) and (d), you may assume that there are  $N$  identical consumers.

*UoL: 2015 za /2015 zb*

2. Regulation in the industrial level can be perceived as a dilemma between rules and discretion. Explain which of these two aspects is preferred by modern authorities to regulate a failing industry or firm.

*Final Examination – 2014*

3. Consider a profit maximizing natural monopoly with a usual U-shaped AC curve and a well behaved linear demand curve that crosses AC at its increasing segment. Both of these curves are public information. A regulator decides to intervene in this market in order to increase the quantity produced to maximum, say  $\bar{q}$ . For this, forces a price ceiling,  $\bar{p}$  at the level where  $AC(q) = D(q)$ . Calculate the profits of this monopoly after the regulation.

*Final Exam – 2015*

4. Explain why a weak natural monopoly cannot be sustainable on its own while a strong natural monopoly can.

*End-semester 2 exam – April 2016*

5. A final good is assembled by two components: R and U. The supplier of R is a regulated monopolist whose marginal and average cost of production is 4. Regulation forces the monopolist of R to charge no more than his MC. U is supplied in a perfectly competitive market with marginal and average cost of 6. The demand for the final good is given by  $Q = 64 - P$  where  $P = P^R + P^U$  and  $P^R, P^U$  are the prices of R and U.

- (a) What are the equilibrium  $P$  and  $Q$ ?
- (b) Suppose that the monopolist will sell R only to consumers that purchase U from him. What is its profit-maximizing price of U?
- (c) Is regulation on R effective when tie-in sales are permitted?

*Final Examination – 2014*

6. An industry is served by a private profit-maximizing monopolist. It is common information that the monopolist faces a U-shaped AC curve and a well behaved linear demand curve, which crosses AC at its increasing segment. The regulator cannot affect entry in this industry but can legally intervene by setting a price ceiling  $p_r$ . Find  $p_r$  so that the regulator will force the firm to produce the long-run perfectly competitive quantity.

*Final exam – April 2017*

7. Suppose that a foreign and a domestic firm compete in quantities in the UK market. Using reaction curves, analyze how a government-imposed quota on the amount the foreign firm can sell affects the equilibrium. Under what conditions, if any, could the quota induce exit of the foreign firm?

*UoL: 2009 za*

8. Can barriers to entry be welfare improving? Explain why or why not.

*UoL: 2013 zb*