

Practice problem set 28

Intellectual property

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. To produce a certain homogeneous final good, n manufacturers need two complementary technologies. The patents for these are held by two firms, A and B, that separately license the technologies at a per unit royalty fee w_i ($i = A, B$). The game is as follows. At stage 1, the patent holders simultaneously and independently decide the level of the royalty. At stage 2, the manufacturers compete by simultaneously setting prices and incur marginal production costs $c + w_A + w_B$, where c is a constant. The face market demand $q = 1 - p$. As usual, if several manufacturers all charge the same lowest price, demand is equally shared among them; manufacturers having higher prices have zero demand.

(a) Find the equilibrium levels of royalty fees and final prices.

Consider now an alternative situation where the two patent holders assign the exploration of their patents to a patent pool. It is now the pool that sets the levels of both royalties.

(b) Find the equilibrium levels of royalties and final prices under the patent pool and compare them with the situation in part (a).

(c) Show that forming the patent pool is both profitable for the patent holders and good for consumers.

UoL: 2011 zb

2. Consider a perfectly competitive industry, in which every firm produces at a cost c per unit. One day, firm i discovers a method that can lower the unit cost to $c - x$ and immediately patents the innovation.
 - (a) Explain what will happen to the surpluses and efficiency of this market during the life of the patent.
 - (b) Assume that i decides to license the patent to the other firms for a royalty, ρ . That is, anyone who will use the patented method will have to pay ρ per unit to i . Find ρ and explain what will happen to the surpluses and efficiency of this market during the life of the patent.
 - (c) Explain what will happen to the surpluses and efficiency of this market after the expiration of the patent.

Homework 14 – 2017

3. Consider a perfectly competitive industry, where the inverse demand is $p = 100 - Q$ and AC is constant to 70. For every firm, R&D of intensity x is able to reduce AC by x but requires an investment by the firm of $15x^2$. The discount factor is 0.9.
 - (a) Find the optimal x if R&D innovations can be protected by a patent for 20 years.
 - (b) Find the optimal x if R&D innovations can be protected by a patent for 25 years.
 - (c) Compare the social welfare from both different durations.

Homework 14 – 2017

4. Briefly explain which form of IP (if any) is suitable for the following items:
 - (a) The tune that Intel has created and uses in all its advertisements.
 - (b) This question in this test that the lecturer has created.
 - (c) The Coca-Cola recipe.
 - (d) The invention of a chair that has five legs instead of four.
 - (e) The invention of a quantum processor that requires a component that has not yet been invented.

Final exam – April 2017

5. Explain the rationale for government policy toward research and development in the form of (i) a patent system, and (ii) R&D subsidies. Then discuss the advantages and disadvantages of these policies, with reference to any relevant empirical evidence.

UoL: 2002 za / 2006 zb

6. 'Since patents generate monopolies, and monopolies generate deadweight loss, society would be better served by eliminating patent protection for innovations.' Discuss this statement with reference to economic theory and any relevant empirical evidence.

UoL: 2014 za