

## MBA 405B

### Problem set 2

Due: Wednesday, May 1, 2002

1. You own a manufacturing plant that produces special purpose electronic gear. You can assemble the parts, but you outsource the production of custom purpose computer chips for your products. **There is a long lead-time in producing these chips. If chipmakers spend the time and money to be extremely careful with your order, a high proportion of the chips will turn out to be good. Otherwise, a high fraction will test out to be bad and will have to be discarded.** This creates a dilemma. If a shipment happens to be of low quality, you can either accept it and then manufacture only part of the planned production run, or reject it and order a new batch of chips. Accepting the bad batch of chips and limiting the production run is quite costly, however, the delays involved in rejecting the batch and waiting for the new higher quality set of chips is even more costly. If you accept any batch of chips, you have to pay the manufacturer. If you reject a batch of chips for poor quality, you don't have to pay. Assume that the manufacturers know all of the above, and also that you seldom use the same chip producer twice.

You are thinking of employing an independent quality assurance firm that will test the chips before they are shipped and who will instantly reject and destroy any batch of chips that falls below a certain quality. Employing the quality assurance firm is costly (but not as costly as using a bad set of chips). One of your employees points out that you can easily test the chips for free yourself and argues that this is a foolish strategy. How do you respond? What possible advantage is there in paying extra money to have someone else implement a strategy that you could easily do yourself for free?

2. In the town of Villa Grove, there is only one liquor store. As a consequence, the prices are high and profits are large. The store has been there for years and the owner is quite well off. As a result, he does not think he should be worried about another store opening up to compete with him. If one did, he could afford to lower prices for a long time to drive the competitor out by forcing profits for each of the stores to be at a very low level. Clearly, Villa Grove is a quite a risky environment for anyone considering going into the liquor business. One of the long time residents decides he is going to try his luck anyway. He mortgages his house, sells his car and invests every dime he can get his hands on. He builds a brand new building for the store and spends a lot of money on advertising. This seems like an irrational strategy. Rather than hedge his bets by renting a store, and limiting his capital investments, the new liquor storeowner has chosen to put himself at considerable risk. What possible motivation can there be for this lack of caution?

3. In some countries, people drive on the left side on the road and in others they drive on the right. Crashing is bad and gives a payoff of  $-1$ . Not crashing is good and gives a payoff of  $1$ . Consider two drivers going in opposite directions on a road who must choose to drive on either the right or left side. Write this out in matrix form as a one-shot game. What are the pure strategy Nash equilibria? Are there any mixed strategy equilibria?
4. As devoted capitalists, we are, of course, opposed to any form or interference with the marketplace, however sometimes markets fail. Consider the following two regulations. Explain whether they fall under the category of interfering with the marketplace, or solving a market failure. Detail what you think the interference or market failure might be.
  - a. The government mandates that everyone who does landscaping work take 40 hours of continuing education classes on any subject they choose.
  - b. The government prohibits the use of certain chemicals that may interfere with the reproductive cycle of certain songbirds.
5. In the old days, commercially produced, paper journals were the most convenient way to get access to new scientific research. Now, however, most researchers use the web to access electronic versions of the old paper journals. The problem is that it is now both cheap and technologically easy for professors to create their own electronic journals and bypass the commercial publishers. There are a number of reasons to do so, most especially the fact that commercial journals are very expensive (thousands of dollars per year). Many libraries are unable to afford subscriptions to all the journals that their faculties need. This in turn hinders scientific advance.

Although the established commercial journals have a lot of prestige, and professors care a great deal that they publish their work in the most prestigious place possible, it is not at all clear what sustains this situation. All that would have to happen is for the scholars in a given field to move their loyalty to from the old to a newly created, noncommercial electronic journal. If they did so, the new journal would have the same prestige as the old one, and the commercial journal would have to fold. Everybody would be a winner except the commercial publishing house. What makes it hard to imagine that this optimistic outcome will happen? How might externalities of a type play a role?
6. (Only graded if we got this in class on Wednesday. Otherwise, this is just for practice.) Suppose that you are starting a band. If you have a singer, a bassist, a lead guitar and a drummer, you make \$400 a night. If you only have any three of these, you can get \$250. If you have only two, you can get only \$100. Finally, no musician working on this own can get job, so a single person individually makes \$0. Write out this game in characteristic function form. What constraints have to be satisfied for an allocation to be in the core? Give two examples of a core allocation and one example of an allocation not in the core along with the allocation that blocks it.