Final Exam

You have three hours to complete the exam, be certain to use your time wisely. You may answer questions directly on the exam or submit typed responses. Exams can either be emailed to me or placed in my mailbox in the economics department office. Answer all questions completely but concisely. Including additional incorrect information in an otherwise correct answer may result in the loss of points. The exam is open notes and open book. You may use your notes, the textbook and any of the materials posted on our course Blackboard site. Other materials are not permitted. Remember to put your name or exam code on the exam. Good luck!

Name or Exam Code:

1. (10 points) Boldrin and Levine argue that copyrights and patents are often counterproductive when attempting to maximize total surplus. Let's consider what would happen if the United States eliminated patents and copyrights.

    (a) Explain why innovation would still take place in the absence of patents and copyrights, even if the only motivation behind innovation is earning profits.

    (b) Explain why, even if some innovation is discouraged by the lack of intellectual property rights, total surplus may still increase when copyrights and patents are eliminated.

2. (25 points) Suppose that Virginia is considering instituting its own cap and trade program to control pollution levels. Virginia has a mix of old and new factories. In both types of factories, the marginal costs of reducing pollution increase as the level of reductions increase. However, at any given level of pollution reductions, the marginal costs of reducing pollution by one more unit are higher at an old factory than at a new factory. The marginal benefits of pollution reduction are constant.

   (a) Suppose that Virginia creates pollution permits and distributes them evenly between old and new factories. Factories need a permit for each unit of pollution they produce. They must eliminate any unit of pollution for which they do not have a permit. Initially, it is not possible to trade these permits. On a graph with the level of pollution reduction on the horizontal axis and costs and benefits in dollars on the vertical axis, show the marginal cost curves for a new factory and an old factory, the marginal benefit curve, and the deadweight loss generated by this non-tradeable permit program.

   (b) Explain why the current permit program will not lead to efficient levels of research into greener production technologies by the firms. From the firm's perspective, a greener production technology can be thought of as a technology that leads to lower marginal costs of pollution reductions. Be certain to consider both the firms with old factories and the firms with new factories.

   (c) Suppose that Virginia now decides to make the permits tradeable. Firms can buy and sell permits from one another at whatever price they agree on. After several years, the market price of permits remains significantly higher than the marginal benefits of pollution reduction. Explain why it would likely increase efficiency if Virginia began to issue more permits.

3. (20 points) Consider the contingent valuation study used to assess the value people placed on the environment in the Exxon Valdez case. Suppose we wanted to take a similar approach to assess the value people place on their own lives. How would you design the survey? In other words, what types of questions would you ask, how would you ask them, and how would you use the answers to determine an estimate of the value of a human life? Be certain to fully explain your reasoning, including a discussion of steps that would be necessary to guard against overestimates and underestimates of the value of a life.

4. (25 points) Consider the market for soda and the market for milk. Demand for soda is highly elastic, consumers will buy substantially more soda if it is cheap and substantially less if it is expensive. Demand for milk is rather inelastic. Parents want their children to have a glass of milk every day independent of the price of milk; demand for milk therefore changes very little when the price of milk goes up or down. You can assume that the markets for both soda and milk are highly competitive and producers in both industries have constant marginal costs.

   (a) Suppose that under the initial equilibrium, the price of milk is equal to the price of soda and the same quantities of both are being sold. Use graphs of the market for milk and the market for soda to show that a small innovation by a soda producer or milk producer will lead to the same increase in profits for the innovator, assuming that the innovation is protected by a patent (other firms cannot copy it). Innovation in this context can be thought of as finding a way to lower the constant marginal costs.

   (b) A politician argues that milk is a necessity and any reductions in costs should be passed along to consumers. To accomplish this, the politician proposes reducing the length of patents on milk technology. Explain the likely effects of this policy change on future innovation in the milk industry, efficiency in the milk market and equity in the milk market.

   (c) Use your graphs and a written explanation to explain why it may be more efficient to have patents on soda technology be shorter than patents on milk technology.

5. (20 points) The federal government is concerned with cell phone use in cars. In order to reduce the number of accidents caused by people using their cell phones while driving, a legislator proposes a law requiring all car manufacturers to equip their new cars with Bluetooth so that drivers can make and receive calls hands free.

    (a) Explain two reasons why drivers may use their cell phones too frequently while driving from an economic efficiency standpoint.

    (b) Suppose that after the Bluetooth legislation gets passed and new cars are equipped with Bluetooth, accidents do not decline. The press claims that the legislation was a failure because it had no effect on driver behavior. Supporters of the legislation point to controlled studies where a driver having a phone conversation with a hand held cell phone has a significantly higher likelihood of crashing than a driver having a conversation using Bluetooth to make the call hands free. They also point to studies showing that the availability of Bluetooth technology in a car makes it far more likely that the driver completes calls in a hands free manner. Explain how you can reconcile the results of these studies with the observation that the Bluetooth law had no effect on accidents.

    (c) Explain how civil suits might be used to reduce the level of cell phone use by drivers. Are there any risks to using civil suits to make the roads safer?