Take Home Exam #1

DUE AT THE BEGINNING OF CLASS ON TUESDAY, FEBRUARY 25

Answer each of the following three questions. The goal of each essay is to see how well you are able to apply the tools discussed in class to a real-life situation. For each question, your answer should clearly state the relevant economic theory and how it relates to the problem at hand. Be sure to address all of the issues raised in each question, and to explain your positions. Finally, take the time to think before you write. Well-thought out, well-written answers will be rewarded. A direct, concise explanation is better than a five-page treatise. For each question, I have provided guidelines as to the appropriate length for each answer (single-spaced answers are acceptable, although not necessary). Choose the level of detail needed to fit your answer within the guideline. I am not just looking for how much you know, but how well you are able to communicate what you do know, which includes filtering through information to highlight the most relevant points.

The exams are due AT THE BEGINNING OF CLASS on TUESDAY, FEBRUARY 25. Late exams give you an unfair advantage over other students in the class. As a result, late exams will be marked down one grade for each day late, starting AT THE BEGINNING OF CLASS on TUESDAY, FEBRUARY 25. If you will not be in class on Monday, it is your responsibility to get the exam to me BEFORE CLASS. Do not just leave the exam in my mailbox, as I need to know when you hand the exam in.

As you work on your answers, you are permitted to consult written sources, including the lecture notes and textbook. However, the final product should be your own work. As a result, you should not discuss the exam with other students in the class until the exams have been handed in on Tuesday.

And now, the questions…

I. Market Failures and Knowledge (2-3 pages)

One justification that economists often give for government intervention into a market is that market failures are present. During the first section of this course, we have focused on policies aimed to correct market failures that affect innovative activity. So far, we have discussed intellectual property rights, direct government subsidies of R&D, and R&D tax credits. This question asks you to think about the market failures and how potential solutions address these market failures.

First, what market failures do economists argue occur in markets for knowledge? In what ways do these market failures affect the level of innovative activity? Second, discuss briefly how each of the three policies mentioned above help to encourage more innovative activity. Explain how each of these policies addresses the market failures present in markets for knowledge. What differences do you find in how each of these policies is likely to affect both the level and the type of innovative activity done?
II. Copyrights in a Digital Age (3-5 pages)

A recent article in the *Economist* (January 25, 2003, pp. S12-S17) contained the following quote:

“[Until recently,] the balance between the public’s access to new ideas and the incentive to creators to produce and publish them has largely been preserved. Some important exemptions to copyright have been retained. Copying works solely for private use is allowed, as is small-scale copying by schools and libraries. And “fair use” provisions allow others to quote short sections of a work to comment on it. Big advances in the technological ability to copy works, such as photocopying and the video cassette recorder, have produced much debate but failed to upset this delicate balance.

Digital technology, though, may shatter it once and for all…. *In retrospect, the copyright balancing act has survived only because of the imperfections of earlier copying methods.*” (emphasis added)

The article also discusses potential solutions to the “digital technology problem.” Among them are the following:

- The use of sophisticated encryption technology to discourage reproduction of copyrighted materials. Many firms already make use of such technology.
- Taxing Internet access and the equipment used for such access. Under this proposal, downloads of digital material would be tracked, and the revenues of the tax distributed to copyright holders.
- Requiring copyright holders to renew copyrights every five years. In addition, a “use it or lose it” provision would require copyright holders to make their work available to the public. Those unwilling to make a work available to the public would be required to grant a license to those wanting to distribute the work.
- Strengthening copyright protection. Rather than allowing exemptions that make it unclear when copyrights are infringed, creators should be given the exclusive right of commercial exploitation of their work.

This question asks you to consider the effect of digital technology on copyright protection, and to evaluate the proposed solutions. In what ways have digital technology proved problematic for existing copyright law? Do you agree with the *Economist’s* claim that copyrights have only succeeded until now because of weaknesses in copying technology? Finally, in what ways do the above proposals address current weaknesses in copyright law brought about by digital technology? Do you think that major changes are necessary to address these problems, or can existing copyright laws simply be modified to be compatible with changing technology?
III. Patents for Biotechnology (2-4 pages)

Since the Supreme Court ruled in 1980 that new microorganisms could receive patent protection, the United States has granted many patents related to biological organisms. Most recently, controversy has developed over patenting of genetic sequences. Such patenting has helped U.S. biotechnology firms gain international prominence. As a result, other countries have been forced to decide whether or not to recognize patents pertaining to microorganisms and genetics.

To help clarify Europe’s position on biotechnology patents, the European Parliament adopted Directive 98/44/EC in July of 1998. European patent law allows patents for inventions, but not for discoveries. The Directive declares that the mere sequencing of DNA is discovery, rather than invention, but isolating a specific DNA sequence through technical means qualifies as invention. Unfortunately, this clarification has not made patenting easier for biotechnology firms, as uncertainty still exists over the interpretation of the directive.

As an expert on science and technology policy, you have been asked by the European Union to help resolve this uncertainty. Using the U.S. experience as a guide, you have been asked to evaluate both the pros and cons of allowing genetic patents. In particular, the EU wants your opinion as to whether the EU should clearly recognize genetic patents as non-obvious inventions, and thus allow easier patenting as is done in the U.S., or whether all genetic patents should be considered discoveries, and not patentable. In making this recommendation, you have been asked to consider how any changes are likely to impact European biotechnology firms, as well as the welfare of European citizens, who are likely to be affected by changes in the availability of new treatments.