Information Economics, Fall 2013
Final Exam

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Rules

1. This is a take-home exam. You may check your notes, course videos, reference books, papers, and everything you may find on Internet. For group problems, you may discuss with and ONLY with your teammates. For individual problems, you CANNOT discuss with anyone. If one is caught to disobey the above rule, she/he will definitely FAIL this course with no exception.
2. If you cannot understand any problem, let the instructor know through e-mails. You may want to do it as soon as possible, because the instructor may not be able to stay in front of a computer for the whole day. The instructor will try his best to answer any question, but he does not promise to answer all the questions, especially late questions.
3. The deadline of this exam is at ***5:00pm on January 10, 2013***. Submissions within 5:00pm and 5:30pm will get twenty points off (not 20% off) as a penalty. Submissions later than 5:30pm will not be accepted.
4. Before the due time, you need to put ***a hard copy*** of your work into the instructor's mailbox at the first floor of Building II, College of Management. If you do not type your answers, make sure that your hand writing is understandable by everyone.
5. Each team should submit only one copy for their group work. You do not need to have the same teammates as for homework or class problems.
6. A team can have at most three students. For a team with only one or two students, the team's grades for group problems will be $\min\{x+5, 40\}$, where x is their original grades.
7. Try your best to make your answers precise, concise, and complete. This is an exam!

1 Group problems

In this problem, we consider the market of electronic books (e-books) and readers for e-books (e-readers). In this market, key players include, but are not limited to, book publishers, e-reader manufacturers, book and e-book retailers, and consumers. For example, Sony is an e-reader manufacturer and KDDI is an e-book retailer in Japan. As another example, Amazon is an e-reader manufacturer and retailer for books and e-books at the same time.

Traditionally, when there was no e-books, the interaction between publishers and book retailers are simple (at least simpler than what is happening now). A book publisher plays the role of manufacturer who make products (publish books), ship products (physical books) to retailers, and let retailers sell the book. They may adopt the simplest wholesale contract or other contract forms (quantity discount, buy-back, revenue-sharing, etc.), but in most cases the publisher and retailer determine the wholesale price (probably with other contractual terms) and then the retailer determines the retail price. Things are not very different from supply chains for other products.

With the invention of e-books, however, things becomes more complicated. Let's take Amazon as an example. Amazon, the retailer and e-reader manufacturer, makes and sells its own e-reader Kindle to consumers. Besides buying books from publishers, Amazon now also makes and sells e-books (with the approvals from publishers, probably with some licensing fees). Therefore, now a consumer may choose to buy either a physical book or an e-book from Amazon for the same book. Naturally, one seldom buys both. If the physical book is expensive (which is usually true in the US), a cheap e-book will results in a great reduction of the sales of the physical book. While Amazon may be happy for this (with the revenue from e-books and Kindle), a publisher may get hurt.

Several new ideas thus emerged in the supply chain for books and e-books. One particular change is that several publishers now ask Amazon to allow them to set the retail price of e-books by themselves. This changes the role played by Amazon: It is still a physical book retailer but it is only an e-book selling platform. The reason for a publisher to do so is clear. However, the impact is unclear. Will the retail prices go up or down? Will the change really benefit the publisher? Will it hurt Amazon? What will happen to consumers and social welfare?

There are many other interesting issues here. It is conceivable that Amazon knows more about consumers than a publisher does. If Amazon can do a more effective pricing decision for e-books, why it allowed some publishers to set retail prices? For Sony, who only sells e-readers rather than e-books, who will it prefer to set the retail prices of e-books? Why? Are there other contract formats that are more efficient? What is the role played by information asymmetry in this market?

1. (10 points) What will be the impact of letting a publisher to determine the retail prices of e-books published by it? Answer this question using only economic reasoning and intuitions. Do not use models. Grades will be given according to the logic of your reasoning and the completeness of your answer.

2. (30 points) For the e-book and e-reader market, ask ***three*** other research questions and make some conjectures about those questions. You need to clearly define the questions you ask. For each question, at least you need to make conjectures through economic reasoning and intuitions. Using game-theoretic models to support your arguments is not required but certainly a plus. Grades will be given to you according to how important your questions are, whether your economic reasoning is logical, whether your models and analysis are meaningful and correct (if you have them), and how nontrivial but reasonable your answers are.

   Note. If you do not know how to start, focus on informational issues and try to use the knowledge you learned in this course to address your questions. Let the instructor know that you learned a lot is a good strategy to earn grades.

2 Individual problems

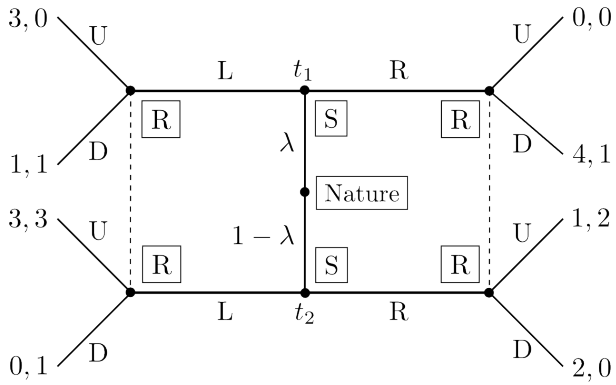
1. (15 points) A principal hires an agent to perform a task. The agent may take a certain action to enhance the probability for the task to be successful. We use $a = 1$ to mean that the agent takes the action and 0 otherwise. Similarly, we use $x = 1$ to mean that the task is successful and 0 otherwise. The relationship between a and x is given by $\Pr(x = 1|a) = p + qa$, where p and q are given parameters satisfying $p \geq 0$, $q \geq 0$, and $p + q \leq 1$. The action a is the agent's hidden action. The principal's utility is $x - w(x)$, where $w(x)$ is the outcome-contingent wage. The agent's utility is $w(x) - ca$, where $c > 0$ is a given parameter. As the outcome is binary, the most general contract form is $w(x) = \alpha + \beta x$. For simplicity, let's assume that α is fixed and cannot be changed. The principal's problem is simply to choose β. Both players are expected utility maximizers.

   (a) Formulate the agent's problem and find the equilibrium a.

   (b) Formulate the principal's problem and find the equilibrium β.

   (c) Intuitively, when the action is more costly (i.e., c becomes larger), the principal needs to provider a larger incentive (i.e., β will be larger). Prove or disprove the above intuition.

2. (20 points; 10 points each) Consider the signaling game depicted below. Suppose $\lambda = \frac{1}{2}$.



   (a) Find all the pure-strategy separating equilibria, if any, or conclude that there is none.

   (b) Find all the pure-strategy pooling equilibria, if any, or conclude that there is none.

3. (10 points) Many people believes that the tuition fees for universities in Taiwan are too low. They claim that this is one of the main reasons that Taiwanese students miss classes so often. What do you think? Do you think raising tuition will provide incentives for Taiwanese students to study harder? Will it be good or bad to raise the tuition? Use economic reasoning to provider your comments. Limit your answer to be within 500 words. Grades will be given according whether your reasoning is logical and of economic implications.

4. (15 points; 5 points each) In this problem, please provide your comments to this course. For each subproblem below, limit your answer to be within 500 words.

   (a) For all the topics taught in this course, which one impressed you the most? Write it down, briefly explain what the issue is and what the insight we get is, and let me know why you learned a lot in it.

   (b) If there is one topic that should be removed from this course, what is it? Briefly describe why.

   (c) Do you think that doing the final project help you learn more or know the course materials better? If yes, briefly describe why. Is there anything that should be changed for the final project so that it can become more helpful?

   Note. As long as you write down your true thoughts, I believe you will get full credits for this problem. Please help the instructor and future students by giving your valuable suggestions!