Name: **Key**

Econ 280

**Exam 04**

* There are 110 possible points on this exam. The test is out of 100.
* You have two hours to complete this exam, but you should be able to complete it in less than that
* Please turn off all cell phones and other electronic equipment.
* You are allowed a calculator for the exam. This calculator cannot be capable of storing equations. This calculator cannot double as a cell phone or other device.
* Be sure to read all instructions and questions carefully.
* Remember to show all your work.
* Recall basic logic. “Water is wet” is a true statement. “Water is wet and leopards have stripes” is a false statement.
* *Please print clearly and neatly.*

**Part I: Multiple Choice.** *Choose the best answer to the following.*

3 points each.

1. Established in 1947, the GATT aimed to:
   1. **Reduce tariffs**
   2. Protect price discrimination
   3. Break up monopolies
   4. A & C
   5. None of the above

*The goal of the General Agreement on Tariffs and Trade is to reduce tariffs.*

1. Which of the following methods might the Commerce Department use to determine if a firm is “dumping?”
   1. Estimate the firm’s cost of production
   2. Investigate how much the firm charges in other countries
   3. Reduce switching costs
   4. **A & B**
   5. None of the above

*The Department sometimes estimates the firm’s cost of production to determine if their prices are below such costs. They also will compare a price charged in the US to the price in another country. They, of course, ignore price discrimination, the beef-hides problem, and other factors which complicate their analysis.*

1. Which of the following is an example of adverse selection?
   1. Going to see a bad movie.
   2. Universal health care.
   3. Lending to a con artist.
   4. **A & C**
   5. None of the above

*In both A and C, the selection was always a bad idea—the movie was always bad and the con artist was always dishonest. In option B, however, people get health care and then, with that coverage guaranteed, use it more than they otherwise would. See the discussion of the RAND health study in Lecture 10 for more information.*

1. Which of the following is an example of someone being rationally ignorant?
   1. A geography teacher not knowing where New Zealand is located
   2. **A taxi driver not knowing all fifty states and their capitals**
   3. A New York City tour guide not knowing when the Statute of Liberty was built
   4. B & C
   5. None of the above

*While A and C have an incentive to understand facts about New Zealand and the Statute of Liberty, a taxi driver gains very little if he knows geographical trivia about the U.S.*

1. The Colorado River—the one that carves the Grand Canyon—doesn’t empty into the ocean like other rivers. In The Colorado River: Flowing Through Conflict, photographer Peter McBride blames “too many straws.” Farmers use the Colorado to grow the U.S.’s *entire* winter lettuce and carrot crop. It’s easy for anyone to pull water from this 1,450 mile long river (crossing seven states and two countries). With this information in mind, the lack which of Ostrom’s design principles best explains this tragedy of the commons?
   1. **Clearly defined boundaries**
   2. Graduated sanctions
   3. Congruence between rules and conditions
   4. Conflict resolution mechanism
   5. None of the above

*It is so easy to get access to the River, especially since it crosses so many states and is so large, that it is difficult to establish clearly defined boundaries. Even if you had graduate sanctions and other principles, detection of betrayal would be difficult and entry into the CPR would be easy.*

1. Which of the following is the strongest reason why all high-tech firms should rely on patenting their inventions to profit from their intellectual property?
   1. Because many high-tech firms invent new means of production in addition to new products
   2. Because high-tech firms tend to have few direct competitors
   3. **Because the next invention comes from previous ones**
   4. A & B
   5. None of the above

*Patents are valuable but especially valuable as a group of patents since technology tends to build on itself. By patenting many things, the firm increases its own portfolio and thus makes it easier to invent other things, even if those early inventions, by themselves, weren’t that great.*

1. In the following game, describe the Don’t Shoot strategy for Omar.

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Mustafa | |
| Dodge | Stand |
| Omar | Shoot | -1 , 5 | 10 , -10 |
| Don’t Shoot | -2 , -2 | -2 , 3 |

* 1. Weakly Dominate
  2. Strictly Dominate
  3. **Dominated by Shoot**
  4. Nash Equilibrium
  5. None of the above

*Shoot is a strictly dominate strategy (-1 > -2 and 10 > -2), thus Don’t Shoot is dominated by Shoot.*

1. When does vertical integration decrease deadweight loss?
2. **When each firm in a production process is horizontally integrated**
3. When the marginal cost of production is zero
4. When antitrust legislation is particularly strong.
5. B & C
6. None of the above

*As noted by double marginalization, if you have a chain of monopolies, you can create more efficiency by letting them integrate into one monopoly.*

1. We discussed many different types of price discrimination in class. Which of the following types would describe the pricing behind a single price for buying several different cable channels at once?
2. Peak-load pricing
3. 2nd degree pricing
4. Tying
5. B & C
6. **None of the above**

*This is an example of bundling, as in you pay one price for a bundle of different channels.*

1. How does a patent buyout system encourage economic efficiency?
2. It avoids the tragedy of the anticommons problem without shortchanging inventors
3. It encourages firms to rely on trade secrets and first mover advantage to generate revenue from new technology
4. It maintains the incentive to invent without discouraging downstream innovation
5. **A & C**
6. None of the above

*By buying out patents and releasing them to the public domain, you remove private property (thus assuaging the anticommons tragedy) while maintaining the incentive to invent. Also note that the anticommons problems originates in the fact that technology is often downstream, which you don’t discourage if you let anyone use the upstream technology.*

1. What is a long-run implication of the law of one price?
2. **Offshoring to China will not result in a significant increases in profit**
3. The capital account will equal the trade deficit
4. All countries’ currency’s purchasing power will increase
5. B & C
6. None of the above

*Thanks to the law of one price, prices of everything (including labor) should converge. Thus offshoring a firm’s work will not result in significant cost savings or increase in profit since, between identical workers, wages should be the same.*

1. Suppose you manage a manufacturing company. Some of your engineers are very competent, a few are somewhat bad, and one is very, very good. Also suppose that is easy to judge how good of a job the engineers do. Which of the following incentive structures is probably ***not*** a good idea to implement?
   1. Piece rates
   2. Corporate culture
   3. **Tournaments**
   4. A & B
   5. None of the above

*With one person who’s really good, you’ll discourage other people from trying if you set up a tournament (since the winner is virtually predetermined). And since it is easy to judge output, piece rates are probably a good idea.*

1. Which of the following is an example of Type II error?
   1. Buying a faulty car battery
   2. Going to a party that turns out to be terrible
   3. Hiring Jesse who goes on to steals $200,000 from the company
   4. B & C
   5. **None of the above**

*In all cases, someone is doing something that is not their default position, meaning they are rejecting their null hypothesis when they should not have. That is the definition of a Type I error. Some of you might have indicated option A was the correct answer, since we assume car batteries work. But that is an assumption you made which encouraged you to make a poor decision. Type I and Type II errors are about the decisions people make, not the assumptions and reasoning behind them. Note option A and option C are virtually identical: we assume car batteries work and people won’t steal but we also don’t, by default, buy every battery and hire every person. Yet in both cases, we regrettably purchased the good or labor.*

1. According to Coase, why do we have many moderately-sized firms?
2. Organizational costs
3. Opportunity costs
4. Transaction costs
5. **A & C**
6. None of the above

*As Coase points out, the state of several firms is a balance between transaction costs (the costs of participating in the market) and organizational costs (the costs of operating in a hierarchy).*

**Part II: True/False.** *Answer true or false and justify your answer.*

6 points each.

1. According to Elinor Ostrom, local knowledge plays a central role in overcoming the tragedy of the commons.

*True. It is through the use of local knowledge that those with a vested interest in a common pool resource can best manage it. Ostrom’s emphasis of local knowledge explains why local control.*

1. If bidders are risk averse, an English auction will yield more revenue than a 1st price sealed bid auction.

*False. Risk aversion would result in people bidding, and thus paying, closer to their reservation price. They would rather gain definite consumer surplus rather than a mere chance of more consumer surplus.*

1. Under a fixed exchange rate regime, if a currency is undervalued the controlling country will print more of the currency.

*True. If a currency is undervalued, then there is upward pressure on its value compared to what it is set at. By printing more money, the controlling country can reduce that pressure: each unit of currency becomes more abundant and thus less valuable.*

**Part III: Short Answer.** *Answer the following.*

10 points each.

1. Using the midpoint method, calculate the elasticity for the following before and after pairs of price and quantity. Then determine if the good for the indicated change is elastic, inelastic, or unit elastic.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Price Before* | *Price After* | *Quantity Before* | *Quantity After* |
| a. | $50 | $10 | 60 | 100 |
| b. | $5 | $25 | 400 | 200 |
| c. | $1 | $3 | 20 | 4 |
| d. | $9 | $1 | 10,000 | 11,000 |
| e. | $100 | $700 | 30 | 10 |

* + - * 1. *[(100 – 60) / 80] / [($10 – $50) / $30] = 1/2 / -4/3 = -3/8, inelastic*
        2. *[(200 – 400) / 300] / [($25 – $5) / $15] = -2/3 / 4/3 = -1/2, inelastic*
        3. *[(4 – 20) / 12] / [($3 – $1) / $2] = -4/3 / 1 = -4/3, elastic*
        4. *[(1,000) / 10,500] / [($1 – $9) / $5] = 0.0952 / -1.6 = -0.0595, inelastic*
        5. *[(10 – 30) / 20] / [($700 – $100) / $400] = -1 / 3/2 = -2/3, inelastic*

1. Using the information below, calculate the expected values of various uncertain payoffs. Remember to show your work.
   1. An 8% chance to win $200
   2. Rolling a “1,” “3,” or a “4” on a 4-sided die wins $20,000
   3. Rolling a “1” or a “6” on a 10-sided die wins $500 while rolling a “2” on the die results in losing $1,000
   4. There is a 12% chance to find a treasure map and a 10% chance that there is $240,000 in treasure at the end of the map
   5. Roll three dice: an 8-sided die, a 6-sided die, and a 4-sided die. If the 4-sided die results in a “4,” roll it again. If the second roll is a “4,” get $16,000. If the 6-sided die results in a “2” or a “3,” get $1,200. If all three dice result in a “1,” get $384,000. Otherwise, get nothing.
2. *(0.08)($200) = $16*
3. *(0.75)($20,000) = $15,000*
4. *(0.20)($500) – 0.10($1,000) = $0*
5. *(0.12)(0.10)($240,000) = $2880*
6. *(0.25)(0.25)$16,000 + (2/6)$1,200 + (1/8)(1/6)(1/4)($384,000) = $1,000 + $400 + $2,000 = $3,400*
7. Consider the game below. Find rollback equilibrium. Then determine if there is a first or second mover advantage (if any). Be sure to justify your answer.

Alpha

Beta

Beta

-4,4

5,3

1,1

4,-4

Hate

Hate

Love

Peace

Love

War

*Rollback equilibrium here is War, Hate thanks to backward induction. Beta will choose to always Hate. If Beta’s Hating, Alpha wants War (1 > -4).*

*To determine mover advantage, reverse the order…*

4,-4

Alpha

Beta

Alpha

-4,4

3,5

Peace

War

1,1

Hate

Love

Peace

War

*Now the equilibrium is Love/Peace. Alpha will choose Peace if Beta chooses Love (5>4) and will choose War is Beta chooses Hate (1>-4). Thus Beta will choose Love since 3>1.*

*This is a bit of a strange result. Beta moved from 2nd to 1st and got a higher payoff (3>1). Alpha moved from 1st to 2nd and also got a higher payoff (5>1). So is there a first or a second mover advantage? It depends on who you ask.*

*Recall that mover advantage can depend on preferences and skills. Here, Alpha seems to enjoy picking Peace if it leads to Love/Peace more than Beta would enjoy that result. This slight change (from a payoff of 3—which would make it look like a sequential move game of the prisoner’s dilemma—to that of 5) completely changes the game. Note if that 5 was a 3, you would get exactly the same result regardless of move order.*

1. Down syndrome (DS) is a chromosome abnormality that results in severely diminished mental capacity (the average IQ of those without DS is 100; with DS, it is 50). Couples expecting a baby often have the fetus tested for DS; the vast majority of fetuses with DS are terminated. Suppose 3% of fetuses have DS.[[1]](#footnote-1) There are multiple tests for DS. One test called quad screening is 81% sensitive and 95% specific.[[2]](#footnote-2) If this test comes up positive, what are the chances the fetus has DS?

*So, let’s remember Bayes Rule:*

*Or,*

*Where DS is having the abnormality and + indicated the test came back positive.*

*Here, 0.81 is the probability of a true positive and 0.05 (1 – 0.95) is the probability of a false positive.*

*There is about a 33.4% chance that a fetus will have DS if tested positive for DS. One really hopes the couple or doctor orders multiple different tests before reaching a decision to terminate!*

1. For each of the following market changes, describe if the ***Japanese yen (JPY)*** appreciates or depreciates in relation to the Chinese yuán (CNY). Briefly justify your answer.
   1. The interest rate in Japan increased by one percentage point while in China it increases by two percentage points.
   2. Japan develops a new hard drive which is must faster and more effective than conventional hard drives.
   3. The expected inflation rate in China doubles while in Japan it remains the same.
   4. China starts exporting a new kind of rice to Japan.
   5. There is a coup in China while Japan’s government remains stable.
2. *Depreciate; with China having a more attractive interest rate, more people will interested in putting their money the CNY than in the JPY thanks to the higher rate of return.*
3. *Appreciate; this new hard drive would be exported to other countries which would increase the demand for JPY compared to CNY.*
4. *Appreciate; JPY’s buying power remains the same while CNY’s falls so compared to the CNY, the buying power of JPY has increased. One yen is worth more compared to one yuán.*
5. *Depreciate; not only is Japan importing more—making JPY easier to get a hold of—but CNY is harder to find due to its increased demand.*
6. *Appreciate; political instability is not good for productivity (at least in the short run) so JPY will be a more attractive currency.*

1. The CDC estimates that 1 in 691 babies born in the U.S. have DS. About 95% of fetuses with DS are terminated. Thus, for every 1 fetus with DS that will be born, there are 19 others that are terminated. So, if abortion rates were zero, 20 in 710 babies would have DS, or about 3%. [↑](#footnote-ref-1)
2. All numbers for this question are taken from or calculated using values from the DS entry on Wikipedia. Take them with several grains of salt. [↑](#footnote-ref-2)