Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Econ 304—Bethany College

**Exam 01**

* There are 110 possible points on this exam. The test is out of 100.
* You have one hour 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.
* 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.*

4 points each.

1. In November 2012, Apple made an agreement with cell phone maker HTC to stop suing each other for patent violation. That agreement immediately terminated all patent litigation pending against each other and the two agreed to a 10-year cross-licensing agreement. For the next decade, HTC is free to use any Apple patents and vice versa without charge. This creates an opportunity for either company to invest less in R&D and simply free ride off the inventions of the other firm. Why ***wouldn’t*** either company do this? (HINT: This is a prisoner’s dilemma set up; recall repeated play solves the dilemma.)
   1. Because they’ll negotiate a new agreement in ten years and no one wants to share with someone who doesn’t contribute.
   2. Because technology is really important to making a profit.
   3. Because both parties are risk-averse: cheating will surely lead to a punishment as cooperating will lead to a reward.
   4. B & C
   5. None of the above
2. Consider a hypothetical case where, during poor weather conditions, someone drove off a small cliff from a little-used road. The driver sues the county for damages. Suppose judge estimates that putting guardrails along the road would cost $1,000, the probability of an accident is 3%, and the cost the driver suffered (including car repairs and medical bills) is $30,000. Based on the Learned Hand Rule and the information presented, how would the judge rule in this case?
   1. For the county, because B < pL
   2. For the county, because B > pL
   3. For the driver, because B < pL
   4. For the driver, because B > pL
   5. There is not enough information to answer this question
3. Which of the following possibilities for the missing payoffs would make this game one of contributory negligence?

|  |  |  |  |
| --- | --- | --- | --- |
|  | | *Pedestrian* | |
| Due Care | No Care |
| *Motorist* | Due Care | -10,-20 | ???,??? |
| No Care | 0,-110 | 0,-100 |

* 1. -10,-100
  2. 0,-110
  3. -10,-10
  4. None of these would work but there are some that could.
  5. There is no way to make this a game of contributory negligence.

1. Consider the game below. What could X be to ensure there are no Nash equilibrium? (Note there are two Xs, meaning the payoff for each X would have to be the same.)

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **Mitt Romney** | |
| *Defense* | *Attack* |
| **Newt Gingrich** | *Defense* | X, 3 | 7, 4 |
| *Attack* | 2, 4 | 8, X |

1. 1
2. 3
3. 5
4. A & C
5. None of the above
6. Suppose all strategies for all players in a simultaneous-move game are weakly dominant. What must be true about the game?
   1. All payoffs in the game are the same
   2. There is no Nash equilibrium
   3. At least two strategies (one per player) are strictly dominant
   4. A & C
   5. None of the above
7. Describe a dominant strategy for this game (concerning the Northwest Passage).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | **Russia** | | |
| *Sovereignty* | *Compromise* | *Cede Rights* |
| **Canada** | *Sovereignty* | 2,2 | 5,1 | 6,0 |
| *Compromise* | 1,5 | 3,3 | 5,1 |
| *Cede Rights* | 0,6 | 1,5 | 0,0 |

* 1. *Claim Sovereignty* for both Canada and Russia is weakly dominant.
  2. *Claim Sovereignty* for both Canada and Russia is strictly dominant.
  3. *Compromise* for both Canada and Russia is weakly dominant.
  4. There are no dominant strategies, weak or strict.
  5. None of the above

1. Which of the following environmental issues describes a stag hunt rather than a prisoner’s dilemma? Ignore institutional incentives (e.g. fines).
   1. Littering on a public beach
   2. Roommates playing loud music
   3. Polluting a long river
   4. A & C
   5. None of the above
2. Which of the following is a tit-for-tat strategy?
   1. “An eye for an eye, a tooth for a tooth”
   2. Issuing a fine each time someone litters.
   3. Taking steroids gets you permanently banned from official competitions
   4. A & B
   5. None of the above

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

10 points each.

1. If each player has a strictly dominant strategy, the game has exactly one Nash Equilibrium.

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1. It makes more sense to tax dog barking and excrement than it is to create a tradable allowance. (The externality here is that dogs bark at night and poop in places where people might step in it.)

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1. The chicken game shows why cartels have difficulty being successful.

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

16 points each.

1. Below is a standard prisoner’s dilemma game. At what interest rate would Jack be willing to cheat once if Jill followed a tit-for-tat trigger strategy? What would be the interest rate if she followed a grim strategy? Be sure to show your work.

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **Jill** | |
| *High* | *Low* |
| **Jack** | *High* | 100,100 | 0,195 |
| *Low* | 195, 0 | 99,99 |

1. In the game below, find the mixed strategy equilibrium. Remember to show your work. Diagram the result.

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **Mario** | |
| *Move Right* | *Move Left* |
| **Bowser** | *Move Right* | 3, -3 | -2, 2 |
| *Move Left* | -5, 5 | 1, -1 |

*Don’t forget the last question on the back!*

1. Using the game below, determine if there is a first-mover advantage, second-mover advantage, or no mover advantage. Remember to show your work.

Joker

Batman

Batman

10,30

5,40

20,20

0,10

Banter

Attack

Attack

Attack

Monologue

Banter