Economics 201B - Final Exam

You should do three of the four questions. You have three hours. Good luck.

1. Fishing

A fisherwoman and fisherman must decide whether to fish for salmon or hunt whale. If both fish, both receive 1; if both hunt whale both receive 4. If one fishes and one hunts whale, the fisherperson gets 0 and the whale hunter gets –8.

a. Find the normal form of this game.

b. Find all Nash equilibrium of this game.

c. Are there any dominated strategies?

d. Find the pure and mixed Stackelberg equilibrium in which player 1 moves first.

e. Find the minmax for both players.

f. Which equilibria in part b. are risk dominant?

Now suppose that the game is infinitely repeated

g. Player 1 is a long-run player with discount factor δ; player 2 is a short-run player with discount factor 0. Find the set of perfect public equilibrium payoffs to the long-run player as a function of her discount factor.

h. Find strategies that support the best equilibrium from part f.

i. Player 1 and 2 are both long-run players with common discount factor δ. When δ is close to one describe the set of perfect equilibrium payoffs to both players.

j. Find a discount factor and strategies for part h such that the average present value equilibrium payoffs with public randomization are (3,1).

2. Bad Reputation

A series of two short-run consumers chooses whether to visit a long-run mechanic with discount factor δ or to buy a new car. The existing care either needs a new engine or a tune-up, each with 50% probability. Only the mechanic knows whether an engine or tune-up is needed. There are two types of mechanics: with probability p the mechanic is honest otherwise the mechanic is dishonest. A dishonest mechanic always says the care needs a new engine. The second period is a stand-in for the entire infinite future. As a result we assume that $\delta > 1$ rather than the usual assumption that it is less than one.

If the consumer chooses not to go to the mechanic, he gets 0 as does the honest mechanic. If he goes to the mechanic and the mechanic tells the truth, the consumer gets 2 and the honest mechanic 2; if the mechanic lies, the consumer gets –4 and the honest mechanic 0. So the consumer moves first and chooses whether or not to go to the mechanic. The mechanic moves second, observes the true state of the car, then either reports that an engine is needed or a tuneup is needed. Remember, the game is repeated twice each with time with a different consumer. The second consumer does not observe whether the mechanic is honest or dishonest, only whether he recommended a new engine or a tuneup.

a. What are the best and worst sequential equilibria when $p = 1$?
b. Find a value of p such that the consumer would choose to go to the mechanic if the honest mechanic told the truth, but there is no sequential equilibrium in which the first consumer goes to the mechanic.

Bargaining

Consider the following variation on ultimatum bargaining: there is a pie worth 10 dollars. Player 1 makes a proposal to divide the pie (in dollars, not fractions of a dollar). He may not propose either $10 for himself, or $0 for himself, but may propose anything in between. Player 2 can accept or reject. If he accepts the pie is divided as proposed; otherwise neither player gets anything. Let m_i be the monetary payoff to player i. Suppose that player i's utility is $m_i - cm_{-i}$ where $0 \le c < 1$.

a. Draw a sketch of the extensive form (no need to draw the entire thing).
b. Find the subgame perfect equilibrium for the different values of c.
c. How does the solution depend on c.

Risk Aversion

a. Starting from the expression $u(x-p) = Eu(x+\sigma y)$ with $Ey = 0, Ey^2 = 1$ derive the standard expression for the risk premium p.
b. From experimental data of Peter Boessarts and Charles Plott, individuals in the laboratory are indifferent between getting nothing, and a gamble paying $9.75, -$3.00, -$2.25 each with probability 1/3. For an individual with CES preferences, find the coefficient of relative risk aversion as a function of wealth, using the approximation of part a.
c. If wealth is $350,000, what is the coefficient of relative risk aversion?

d. If the coefficient of relative risk aversion is 20, what is wealth?

e. If preferences are logarithmic what is wealth? For what measure of wealth does the answer in part c make sense?