Economics 201B - Final Exam

You should do all three questions. You have three hours. Good luck.

1. Sequential Equilibrium and Signaling

Player 1 has two types, intelligent or dumb, with equal probability of each type. Player 1 may choose either to drop out of high school or finish high school. If he finishes high school, player 2 must decide whether or not to hire player 1. Player 1 knows his type, but player 2 does not. If player 1 drops out, both players get zero. If player 1 finishes high school, but is not employed by player 2, player 2 gets nothing, and player 1 gets $-x$ if intelligent, and $-y$ if dumb, where $y > x > 0$, and $1 > x$, but y may be either larger or smaller than 1. If player 1 finishes high school and is employed, player 2 gets a if player 1 is intelligent and b if player 1 is dumb, where $a > b$. Here $a > 0$ but b may be either positive or negative. Player 1 gets $1 - x$ if intelligent and $1 - y$ if dumb. For what values of a, b, x, y is there a

a. sequential equilibrium in which both types drop out?

b. separating sequential equilibrium?

Profit Sharing

An author has a utility function $\log(1 + w)$, where w is his money income. He must choose how hard to work on his new novel: he may either work or shirk. The utility cost of working is $C > 0$. The novel may either be a blockbuster, yielding revenue y to the publisher, or a complete bust, yielding revenue 0 to the publisher. If the author works, the probability of a blockbuster is $H < 1$, if he shirks, the probability of a blockbuster is $0 < L < H$. The risk-neutral publisher must choose a royalty rate θ to pay the author: that is, the author receives θR where $R \in \{0, y\}$ is the publisher's revenue from the novel. (The publisher gets $(1 - \theta)R$.) What royalty rate should the publisher choose?

2. Long-Run versus Short-Run

Consider the following two player simultaneous move game:

	L	M	R	S
U	1,1	5,4	1,5	0,0
C	3,5	6,4	2,1	0,0

Suppose the game is played once.

a. Find all Nash equilibria of this game.

b. Find the minmax for player 1.

c. Find the pure Stackelberg equilibrium payoff to player 1 moving first.

d. Find the mixed Stackelberg equilibrium payoff to player 1 moving first.

Now suppose that the game is infinitely repeated between a long-run player 1 and short-run player 2.

e. For large δ find $\overline{v}^1$ the best equilibrium payoff for the long-run player 1

f. Find the critical value of δ for which $\overline{v}^1$ is an equilibrium for larger δ.

g. Describe the equilibrium strategies for both players that give $\overline{v}^1$.

h. For large δ find $\underline{v}^1$ the worst equilibrium payoff for the long-run player 1.

i. Find the critical value of δ for which $\underline{v}^1$ is an equilibrium for larger δ.

j. Describe the equilibrium strategies for both players that give $\underline{v}^1$.