Economic Applications of Game Theory. Second Midterm Exam.

You have one and a half hours. Answer both questions.

1) Consider the following alternating offer bargaining game between two players A and B. A has a discount factor δ_A and B has δ_B. Initially, they have a cake of size equal to 2. In the first period, A makes an offer. B can either accept or reject. If he rejects this offer, then B gets to make an offer in the second period. A can accept or reject. If A rejects, however, in the third period, the cake shrinks to size $x < 2$ (this shrinkage is additional to the usual discounting between periods). From then on, the cake remains of size 1 (but there is still discounting) and the two players alternate in making offers until an offer is accepted.

Draw the game tree and find the unique subgame perfect equilibrium. How does the equilibrium depend on x. Interpret.

2) Consider the following stage game between players A and B:

$A \setminus B$	l	m	r
L	$(-10, 4)$	$(6, 0)$	$(-1, -1)$
M	$(0, 6)$	$(-1, -1)$	$(-1, 1)$
R	$(4, -10)$	$(-1, -1)$	$(2, 2)$

1. Find the Nash Equilibria of this game.

2. Consider a supergame G^T which is obtained by repeating this stage game T times. Find the subgame perfect equilibria of G^T.

3. Now consider $G^\infty(\delta)$ which is obtained by repeating this stage game an infinite number of times with discount factor δ for both players. Find an equilibrium which is preferred to playing the Nash Equilibrium of the stage game. Explain the supporting trigger strategies carefully.