

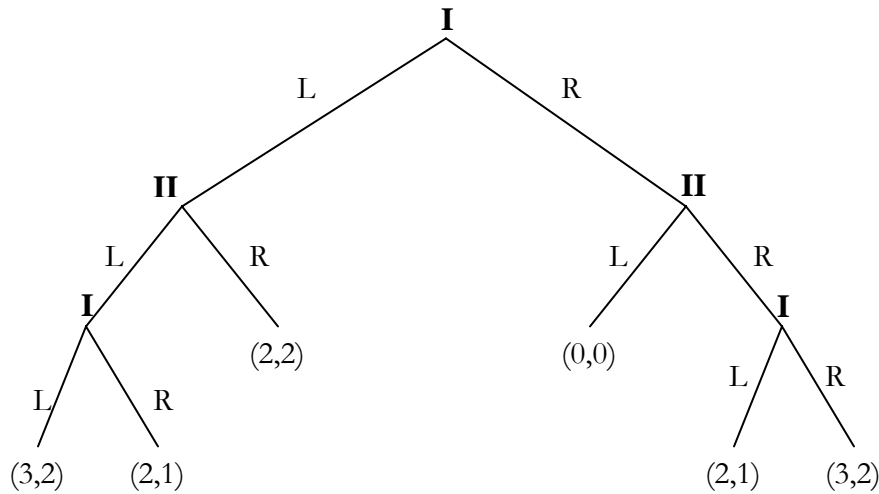
## Economics 414 – Midterm

Please answer ALL questions on this examination. Be sure to explain any non-standard notation that you use.

1. (40%) Consider the following simultaneous move game:

		Player 2		
		L	C	R
Player 1	T	(-10, -10)	(10, -15)	(15, 0)
	M	(-10, 10)	(-5, 0)	(-10, 10)
	B	(0, 10)	(0, 0)	(0, 0)

- What strategies survive Iterated Elimination of Strictly Dominated Strategies?
  - Find all Nash equilibria of the game (Pure and/or Mixed).
  - State the two conditions required for a mixed strategy profile,  $\alpha^*$ , to be a mixed strategy Nash equilibrium. (In other words, state the conditions in Proposition 116.2).
2. (30%) Consider the following extensive game with perfect information:



Note for the payoff (X,Y): X is player I's payoff and Y is player II's payoff.

- Write down ALL possible strategies of each player.
  - Solve for the subgame-perfect Nash equilibria of the game.
3. (30%) Consider the Bertrand model of oligopoly with 3 firms who have the following constant marginal costs:  $c_1 = \$1.00$ ,  $c_2 = \$2.00$ , and  $c_3 = \$3.00$ .
- Solve for the Nash equilibrium when firms can only choose prices in increments of one cent (\$0.01).
  - Solve for the Nash equilibrium when firms may choose  $p_i \in \mathbb{R}^+$  for  $i=1,2,3$ . In other words, when there is NO smallest increment.
  - Is your result in (b) consistent with the Nash existence theorem? Why or why not?