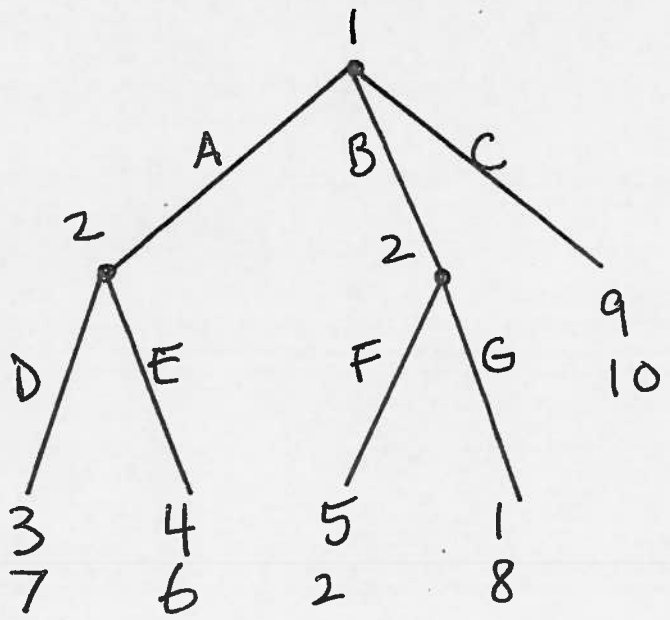
Your Name: _____

The Ohio State University
Department of Economics
First Midterm Examination

Econ 5001
Fall 2017
Prof. James Peck

Directions: *Answer all questions, show all work, and label all figures.*

1. (20 points) *Convert the following extensive form game into normal form, by drawing the payoff matrix, labeling the strategies corresponding to the rows and columns, and filling in the payoffs.*



2. (15 points) Consider the following game.

		player 2		
		L	C	R
player 1	T	4, 3	2, 2	5, 2
	M	1, 3	8, 2	1, 2
	B	2, 3	3, 2	5, 2

Find the set of player 1's best responses to the belief, $\theta_2 = (\frac{1}{3}, \frac{1}{3}, \frac{1}{3})$. That is, player 1 believes that player 2 will choose L with probability one third, C with probability one third, and R with probability one third.

3. (20 points) *In the following game, is player 1's strategy N dominated? If your answer is YES, provide a strategy (pure or mixed) that dominates N. If your answer is NO, provide a belief for which N is a best response.*

		player 2 X	player 2 Y
player 1	K	8, 5	0, 4
	L	3, 4	5, 5
	M	3, 5	2, 4
	N	4, 4	3, 5

4. (25 points) Consider the following game with 7 players. Each player simultaneously decides whether to attend the party (strategy P) or to stay home (strategy H). Let x denote the number of players who decide to attend the party. Then each player who attends the party receives a payoff of $5x$. If a player decides to stay home, then his/her payoff does not depend on what the other players do, but it depends on which player it is. That is, player 1's payoff from staying home is 0, player 2's payoff from staying home is 50, player 3's payoff from staying home is 12, player 4's payoff from staying home is 14, player 5's payoff from staying home is 22, player 6's payoff from staying home is 28, and player 7's payoff from staying home is 32.

Find the set of rationalizable strategies for each player. Equivalently, iteratively eliminate dominated strategies until no more strategies can be eliminated, and report which strategies are left for each player.

5. (20 points) *Consider the following game.*

		player 2				
		P	Q	R	S	T
player 1	B	1, 4	3, 4	1, 5	4, 3	5, 1
	C	2, 5	1, 1	2, 2	5, 2	3, 4
	D	3, 3	4, 2	3, 4	4, 5	3, 1
	E	4, 2	5, 1	4, 5	5, 2	5, 3
	F	1, 1	2, 5	2, 4	1, 3	2, 3

(i) (12 points) Find all of the (pure strategy) Nash equilibria of this game, and report your answer here:

(ii) (8 points) Find all of the efficient strategy profiles of this game, and report your answer here: