Your Name: _____

The Ohio State University
Department of Economics
Second Midterm Examination

Econ 5001
Fall 2015
Prof. James Peck

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

1. (25 points) Consider the following Cournot game in which two firms simultaneously choose a non-negative output quantity. Letting q_1 denote the quantity chosen by firm 1, q_2 denote the quantity chosen by firm 2, and Q denote the total quantity, $q_1 + q_2$, the market price is given by

$$p = 80 - \frac{Q}{100}.$$

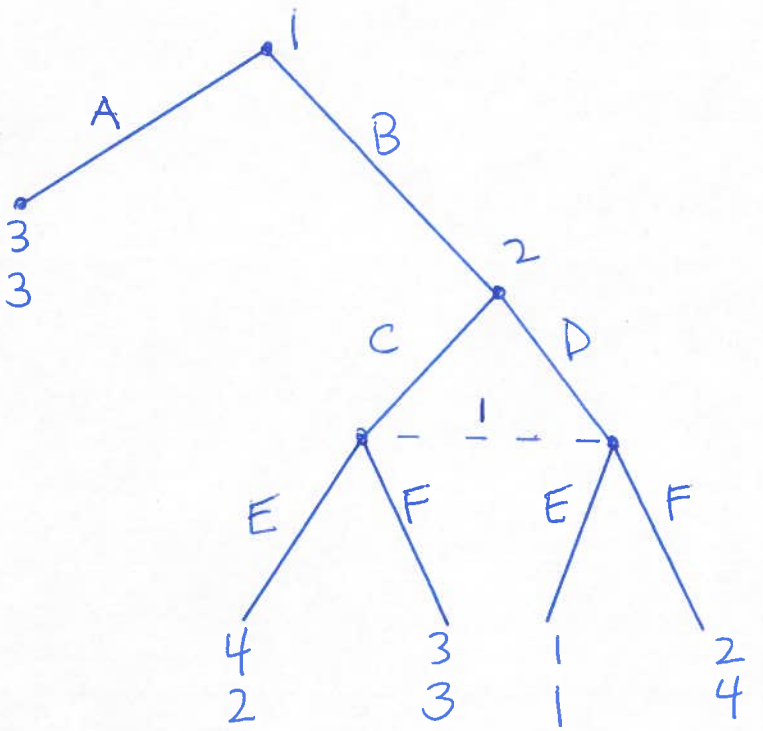
Each firm has a production cost of 20 per unit of output.

Find the Nash equilibrium of this game. What is the equilibrium payoff received by each firm?

2. (25 points) For the following normal form game, find the mixed strategy Nash equilibrium. Show all of your work, and clearly indicate the equilibrium mixed strategy profile.

		player 2		
		a	b	c
player 1	w	5, 6	2, 3	1, 5
	x	8, 2	1, 5	4, 1
	y	0, 3	6, 1	7, 2

3. (25 points) Consider the extensive form game shown below:
(a) (10 points) Find all pure strategy Nash equilibria.
(b) (15 points) Find all subgame perfect Nash equilibria, and briefly explain.



4. (25 points) Consider the repeated game in which the following stage game is played twice. A player's payoff in the repeated game is the sum of his/her payoff in period 1 and period 2.

		player 2		
		X	Y	Z
player 1	A	10, 10	2, 12	0, 13
	B	12, 2	5, 5	0, 0
	C	13, 0	0, 0	1, 1

(a) (8 points) What is the lowest payoff that player 1 can receive in any subgame perfect Nash equilibrium (SPNE) of the repeated game? Clearly and completely specify the corresponding SPNE strategy profile.

(b) (8 points) What is the highest payoff that player 1 can receive in any subgame perfect Nash equilibrium (SPNE) of the repeated game? Clearly and completely specify the corresponding SPNE strategy profile.

(c) (9 points) Is there a SPNE in which the action profile (C, Y) is played in period 1? If yes, then clearly and completely specify the corresponding SPNE strategy profile. If no, then explain your reasoning.