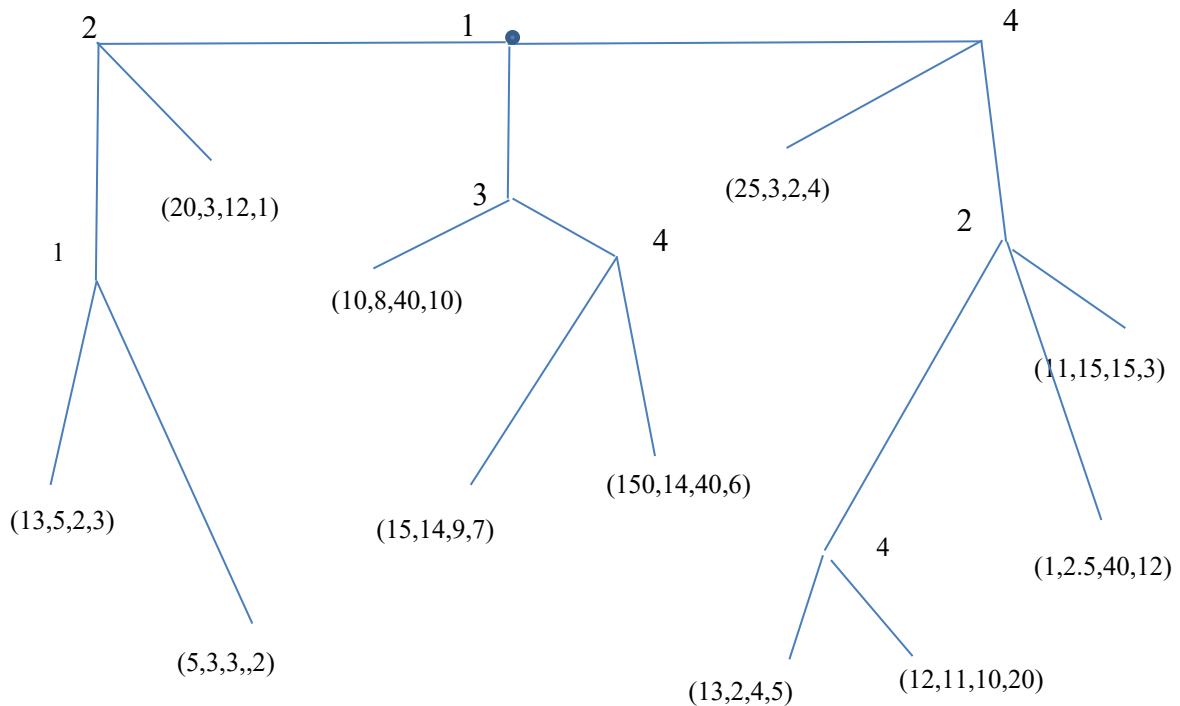


Midterm Exam October, 2018
HONORS 259L
Explain your reasoning clearly.

1. (5 points) Solve the four player game below back to front. The number at each node indicates which player gets to move. Player 1 moves first from the top middle node. The numbers at the end show payoffs (Player1, Player 2, Player 3, Player 4). Pay careful attention to who moves when:



2. (15 points) Consider the simultaneous move game below. The first entry indicates the payoff to the Row Player, the second is Column Player payoff. The symbol, A , represents a non-negative integer less than or equal to 8.

	C1	C2
R1	(3,5)	(4,4)
R2	(A,8-A)	(2,6)

- Find a value of A such that there is a dominated strategy for at least one player and find the Nash Equilibrium.
- For what values of A does a pure strategy Nash Equilibrium *NOT* exist? Please give the full range.
- Suppose $A=5$. Find the maximin/minimax equilibrium of the game.

2. (10 points) You and a co-worker are taking turns placing eggs in a carton that holds 12 eggs. At each turn, you can choose to place 1,2 or 3 eggs in. The worker who places the last egg in the carton wins. The carton is empty and you go first. Provide a back to front solution of the game to show who should win this game.
3. (10 points) In the simultaneous move, two player game, G, below, Player 1 chooses Rows and Player 2 chooses Columns.

G

	C1	C2	C3	C4
R1	(30,30)	(30, 40)	(31, 7)	(31,30)
R2	(20,40)	(46, 30)	(34,31)	(20,20)
R3	(10,28)	(40,30)	(30,40)	(15,50)
R4	(35,15)	(31,10)	(31,12)	(32,10)
R5	(12,8)	(35,9)	(12,10)	(35,9)

Characterize all the pure strategy Nash equilibria of the game, G. Explain your reasoning.

4. (12 points) Albert is attempting to learn to speak Japanese. He has already taken two online courses of 10 hours each and has a rudimentary capability. He is now trying to improve it by reading newspapers and studying vocabulary. He can devote anywhere from zero to five hours a day. It takes a full hour for him just to get into the mindset of thinking in Japanese and then, for every 15 minutes he can learn 5 new words. Every minute he spends on improving Japanese is a minute less that he can work as a tutor for which he is paid \$20 an hour. With this information, provide an example of each of the following and brief justification for your answer.
 - i) Sunk fixed cost or benefit.
 - ii) Non-sunk fixed cost or benefit.
 - iii) Opportunity cost or benefit.
 - iv) Marginal cost or benefit.