test 2

Instructions:

1. Answer all of the following questions on the answer sheets provided. You can write on this list of questions, but credit will be awarded only for answers written on answer sheets.

2. Do not access any book, notebook, newspaper, calculator, computer, cell phone, or other possible source of inappropriate aid during the test, do not leave the room before you are finished taking the test, and be sure to finish the test within this 50-minute testing period. No credit will be given for any work done after you access any possible source of inappropriate aid, after you leave the room for any reason, or after the end of the testing period.

3. When you are finished, be sure your name is written on each of your answer sheets, and turn them in. Also, turn in this list of questions. If you write your name on it, it will be returned with your graded answer sheets.

Questions:

1. Let Lottery F comprise a 70-percent chance of winning $100 and a 30-percent chance of winning $0. Let Lottery G comprise a 50-percent chance of winning $100 and a 50-percent chance of winning $0. Which of the following is required by the reduction-of-compound lotteries condition?

   (a) Lottery F I $70

   (b) Lottery F P Lottery G

   (c) Lottery F P L(1/2, Lottery F, Lottery G)

   (d) L(1/2, Lottery F, Lottery G) I L(60/100, $100, $0)

2. Suppose you are predicting the preferences of a person named Wayne, whose preferences are assumed to satisfy the rationality conditions, with the set of prizes being $\{a, b, c, d, e\}$. Suppose Wayne's favorite prize is a and his least-favorite prize is e, and after asking him questions that relate to the continuity condition, you find that his values of p for prizes b, c, and d, respectively, are 3/4, 2/5, and 1/3. If you had to predict Wayne's preference between two options, and one of them was the lottery L(1/2, b, c), what lottery involving no prizes other than a and e would the substitution condition entitle you to convert that into? (If it is a compound lottery, leave it like that; i.e., do not reduce it.)

3. Suppose that a certain game is played by player 1 choosing $x = 1$ or $x = 2$, then player 2 (with knowledge of player 1's choice) choosing $y = 5$ or $y = 6$, then payoffs to both players being some function of x and y (which is common knowledge between the players). Give an example of one of player 1's strategies, and state how many strategies player 1 has. Then give an example of one of player 2's strategies, and state how many strategies player 2 has.

4. Analyze the following game using dominance considerations and write the strategy pair(s) corresponding to its solution(s). Write each strategy pair in the form (R_x, C_y), where x and y are integers corresponding to row and column numbers, respectively.

	C_1	C_2	C_3	C_4
R_1	4	5	4	6
R_2	9	5	6	2
R_3	8	7	6	7

5. State whether the following game has any equilibrium strategy pair(s). (You can ignore mixed strategies and focus on pure strategies only.) If it does, write it (or each of them) in the form form (R_x, C_y), where x and y are integers corresponding to row and column numbers, respectively.

	C_1	C_2	C_3	C_4
R_1	3	8	5	1
R_2	6	7	6	8
R_3	4	2	3	9

6. Draw the following matrix on one of your answer sheets and fill in each of the four cells with an integer between 1 and 9 (you can use up to four different integers, or you can repeat some integers) so that R_1 dominates R_2 but the outcome at (R_2, C_2) is an equilibrium outcome. (It does not have to be the only equilibrium outcome in your matrix.) Circle all of the equilibrium outcomes in your matrix.

	C_1	C_2
R_1		
R_2		

7. Derive the values of p and q that make $(p\,R_1, (1-p)\,R_2; q\,C_1, (1-q)\,C_2)$ an equilibrium strategy pair for the following game. To derive each value, start with either the equation $EU(R_1) = EU(R_2)$ or the equation $EU(C_1) = EU(C_2)$ – whichever is appropriate – and show your work. Conclude each derivation with an equation of the form '$p =$ __' or '$q =$ __'.

	C_1	C_2
R_1	5	8
R_2	6	2

8. What values of p and q make $(p\,R_1, (1-p)\,R_2; q\,C_1, (1-q)\,C_2)$ an equilibrium strategy pair for the following game? (You do not have to show your work. An answer of the form '$p =$ __, $q =$ __' can earn full credit.)

	C_1	C_2
R_1	6	4
R_2	2	5

Use the following game for questions 9 and 10.

	C₁	C₂
R₁	3	7
R₂	5	1

9. What are the expected utilities of the row player's strategies R_1 and R_2, on the assumption that the column player is playing the mixed strategy (3/4 C_1, 1/4 C_2)? (Do two separate computations and show your work.) Could that mixed strategy for the column player be one half of an equilibrium strategy pair? Why or why not?

10. What are the expected utilities of the column player's strategies C_1 and C_2, on the assumption that the row player is playing the mixed strategy (3/4 R_1, 1/4 R_2)? (Do two separate computations and show your work.) Could that mixed strategy for the row player be one half of an equilibrium strategy pair? Why or why not?

Instructions, revisited:

As stated in item 3 of the instructions, turn in this list of questions along with your answer sheets.