Econ 308 Homework # 3

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1. Find the mixed strategy Nash equilibrium of the following games.

(a)

Player 2

		L	R
Player 1	U	2,1	5,0
	D	3,0	1,3

(b)

Player 2

		L	R
	U	1,3	2,4
Player 1	M	2,7	3,1
	D	5,2	1,4

(c)

Player 2

		L	M	R
	u	4,2	2,0	0,5
Player 1	m	1,4	1,5	1,2
	d	0,2	2,1	3,1

2. You are a member of a five person committee that must choose one outcome from the list (A,B,C,D). Suppose the rankings are:

You	Voter 2	Voter 3	Voter 4	Voter 5
A	C	C	B	D
D	D	B	A	B
B	A	D	C	A
C	B	A	D	C

Which of the following procedures would you prefer to see implemented if everyone is sophisticated? (Please show your work.)

(a) First A vs. B, next C vs. D, and finally the two winners vs. each other.

(b) First A vs. B, next the winner vs. C, and finally the survivor vs. D.

(c) First A vs. D, next B vs. C, and finally the two winners vs. each other.

(d) First D vs. A, next the winner vs. B, and finally the survivor vs. C.

(Note that at each vote the winner is determined by the majority rule.)

3. (a) Consider the following voting problem: There are four alternatives A, B, C, D, and five voters with the following rankings:

Voter 1	Voter 2	Voter 3	Voter 4	Voter 5
A	A	C	D	C
B	B	D	A	B
C	D	B	C	D
D	C	A	B	A

The order of the voting is such that, first A competes against B, next C competes against D, and finally the two winners compete to determine the final outcome. (At each step the winner is determined by the majority rule.) Find the final outcome if voters 1 and 2 are strategic voters (and they know that only they are strategic) and the rest of the voters are sincere voters.

(b) Assume the following rankings by a five member committee:

Voter 1	Voter 2	Voter 3	Voter 4	Voter 5
A	B	C	C	B
B	C	A	A	C
C	A	B	B	A

What is the outcome of the agenda A against B, the winner against C if only voter 2 is strategic (and he or she knows that this is the case). If voter 2 can educate at most one other person to be sophisticated, whom should he or she educate, assuming that voter 5 cannot vote in a sophisticated way for one reason or another? (Please show your work.)

4. The success of a project depends on the effort level of a worker. In case of success the revenues will be $300,000 whereas in case of no-success the revenues will be $0. The worker can provide a low effort level or a high effort level. The effort level cannot be observed by the principal. The worker requires an expected salary of $50,000 to provide the low effort level and an expected salary of $60,000 to provide the high effort level. The success probabilities for the project are 75% in case of high effort level and 25% in case of low effort level. What should be the minimum bonus (that is awarded in addition to the base salary in case of success) and the base salary for the worker so that the worker has the incentives to provide the high effort level?

5. You are one of several drivers in a city. Each driver's utility from driving is

$$u = 50 - t^2 + 6t - 2t_0$$

where t is the number of hours in a day of own driving and t_0 is the number of hours others drive on average.

(a) Suppose that there are no regulations. How many hours will each driver drive per day?

(b) What is an efficient level of driving per day for each driver?

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