University of California, Davis -- Department of Economics

**ECON 106 : DECISION MAKING** Professor Giacomo Bonanno

**PRACTICE FOR FIRST MIDTERM EXAM**

**1.** There are four cards on the table. You see one face of each card:

| A | B | 2 | 3 |
|---|---|---|---|

You are told that one side of each card has either an A or a B and the other side has either a 2 or a 3. You are asked to guess whether the following statement is true about **the entire set of four cards** on the table; "if a card has an A on one side then it has a 2 on the other side". After you have made your guess all the cards are turned over and if your guess turns out to be correct then you get \$100 otherwise you get nothing [thus if you guessed that the statement is true but there is even just one card that does not satisfy the statement then you get nothing].

**(a)** Represent your decision problem using states, outcomes and acts.

**(b)** Does one act dominate the other?

Now a new set of four cards is placed on the table and what you see is the same as before (that is, A B 2 3). However the cards may be different from the ones that were dealt before (although it is still true that each card has either an A or a B and the other side has either a 2 or a 3). This time you are given the same options as before *plus* the option of turning as many cards as you like, before making your guess; however, for every card you turn the prize you get if you guess correctly is reduced by \$$x$ (with $0 < x \leq 25$).

**(c)** What is the minimum number of cards that you need to turn in order to be absolutely certain that you will make a correct guess? How much money can you be sure to get?

**2.** The set of alternatives is $Z = \{a,b,c,d,e,f\}$. It has been observed that, when the available alternatives were *a, b* and *e* Sue chose *e*. We express this by saying that the observation was $(\{a,b,e\},e)$. The following is a list of observations concerning Sue:

$$\{(\{a,d,e\},d),\ (\{a,b,e\},e),(\{a,b,c,f\},b),\ (\{c,f\},c),(\{a,f\},f)\}$$

Sue tells us that during the observation period her preferences did not change and that she is not indifferent between any two alternatives (she always prefers one alternative to another).

**(a)** Find a complete and transitive preference relation that rationalizes the above observations.

**(b)** Write a utility function that represents Sue's preferences.

**(c)** Assuming that Sue is rational, if she had been faced with a choice from the set $\{a,c,f\}$, what would she have chosen?