ECON 106 : DECISION MAKING Professor Giacomo Bonanno

PRACTICE FIRST MIDTERM: $\boxed{\textbf{ANSWERS}}$

1. Recall that the statement "if a card has an A on one side then it has a 2 on the other side" is about the **entire set of four cards**. So 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. If a card is a B-2 then it does not violate the statement (because it does not have an A on one side): the only violations can be instances of A-3.

(a) Given what you see, there are $2^4 = 16$ possible states: (1) A2-B2-A2-A3, (2) A2-B2-A2-B3, (3) A2-B2-B2-A3, etc. Thus the decision problem is as follows:

		STATES															
		A2-B2 A2-A3	A2-B2 A2-B3	A2-B2 B2-A3	A2-B2 B2-B3	A2-B3 A2-A3	A2-B3 A2-B3	A2-B3 B2-A3	A2-B3 B2-B3	A3-B2 A2-A3	A3-B2 A2-B3	A3-B2 B2-A3	A3-B2 B2-B3	A3-B3 A2-A3	A3-B3 A2-B3	A3-B3 B2-A3	A3-B3 B2-B3
ACTS	Guess true	\$0	\$100	\$0	\$100	\$0	\$100	\$0	\$100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Guess false	\$100	\$0	\$100	\$0	\$100	\$0	\$100	\$0	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100

(b) No: there is at least one state where 'Guess true' is better than 'Guess false' and at least one state where the opposite is true.

(c) By turning two cards (namely the first and the last: A and 3) you can determine for sure whether the rule is true or not and therefore you can guarantee yourself a reward of $\$(100 - 2x)$.

(a) There is only one preference relation that rationalizes the observations:

best	d
	e
	b
	c
	f
worst	a

	Observation	Deduction
(1)	$(\{a,d,e\},d)$	d is better then a and e
(2)	$(\{a,b,e\},e)$	e is better than a and b
(3)	$(\{a,b,c,f\},b)$	b is better than a, c and f
(4)	$(\{c,f\},c)$	c is better than f
(5)	$(\{a,f\},a)$	f is better than a

By (1)-(3) and transitivity, d is better then any other alternative. By (2) and (3) and transitivity, e is better than a, b¸ c and f. Thus e is the second-best alternative. By (3) b is the third best alternative. By (4) and (5) and transitivity, c is the fourth best. By (5) f ranks fifth and a ranks last.

(b) Of course there are many. One possibility is the following

		Utility
best	d	5
	e	4
	b	3
	c	2
	f	1
worst	a	0

(c) Since her behavior is rational, she would have chosen c.