Final exam
5/3/2011

Note: Support your answers by showing your work and thoroughly explaining any answers. Points will be deducted for insufficiently supported answers. When in doubt, err on the side of writing too much. This exam is out of 120 points. Therefore, you should allocate about 1 minute/point.

Problem 1 (20 points (6, 6, 8)) Magee's Bakery, in downtown Lexington, estimates that its demand for transparent pies has a price elasticity of -1.5.

a. Suppose Magee's were to increase its price. In which direction would each of the following move: revenue, total costs, profit? For each, answer "increase", "decrease", or "uncertain", along with a brief explanation.

b. Suppose Magee's were to decrease its price. In which direction would each of the following move: revenue, total costs, profit? For each, answer "increase", "decrease", or "uncertain", along with a brief explanation.

c. Finally, suppose for part c only that you now have the additional information that the marginal cost to Magee's of making one transparent pie is \$2 (and is constant). Magee's currently charges \$5 for each transparent pie. Should they increase or decrease this price, or should they leave it at \$5?

Problem 2 (20 points (7, 7, 6)) Skywalker Farms supplies water to the town of Mos Eisley (they are "the water company", i.e. a monopoly supplier). Given their infrastructure of pipes, treatment centers, etc, the marginal cost of supplying one gallon of water is only \$.50 (and is constant), though maintaining their infrastructure has a daily fixed cost of \$75,000. Mos Eisley's daily demand for gallons of water is $P = 20 - \frac{1}{1000}Q$.
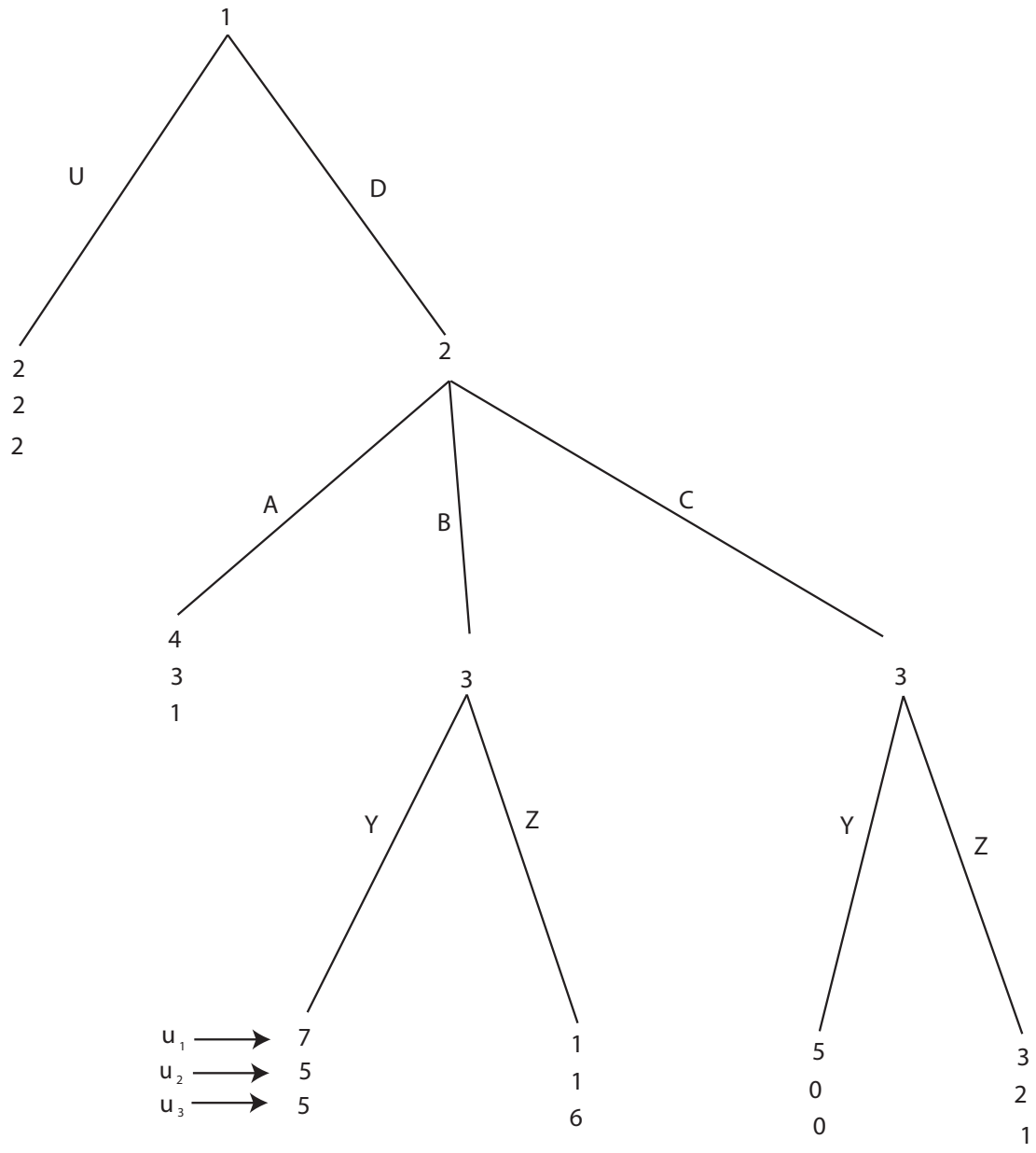
a. Solve for Skywalker Farm's profit-maximizing price. What daily profit do they earn when they charge this price?

b. Emperor Palpatine, in a rare burst of populism, suggests regulating Skywalker Farms by capping the price they are allowed to charge. Briefly discuss in words why this might or might not be a wise policy.

c. You are hired as a consultant to advise the Galactic Empire on this matter. What price ceiling do you recommend they set? Keep in mind that the Emperor wishes to maximize public welfare, and also that Skywalker Farms will shut down if the price ceiling is set so low that they are no longer profitable.

Problem 3 (20 points (10, 10)) Efficiency wages[1] are often suggested as one of the causes of long-term structural unemployment.

a. Explain how efficiency wages arise as a consequence of worker moral hazard.

b. Larry works construction; he works alongside his supervisor, and checks in with him constantly. Creed works for Dunder Mifflin, doing an assortment of poorly-defined general office tasks; he sees his supervisor at coffee breaks, but rarely directly discusses work with him. Which of these workers is more likely to be paid an efficiency wage, and why?

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[1]Efficiency wage = any wage above the market clearing wage.

Problem 4 (20 points) Consider the sequential move game below:

1

U   D

2
2
2

2

A   B   C

4
3
1

3   3

Y   Z   Y   Z

$u_1 \longrightarrow$ 7   1   5   3
$u_2 \longrightarrow$ 5   1   0   2
$u_3 \longrightarrow$ 5   6   0   1

What is the equilibrium outcome of this game?

Problem 5 (20 points, (5, 5, 10)) Elephants are either peaceful or war-like from birth, with peaceful elephants more likely to have peaceful babies, and war-like elephants more likely to have war-like babies. Several times a day, an elephant meets another elephant, and each elephant chooses to either fight or to avoid conflict. If both opt to avoid conflict, they share whatever food source they are after, if exactly one elephant fights, he gets all of the food, while if both fight, both elephants are injured. Payoffs to a typical interaction are below:

		Elephant 2	
		fight	avoid conflict
Elephant 1	fight	$-2, -2$	$4, 0$
	avoid conflict	$0, 4$	$3, 3$

Suppose that war-like elephants always opt to fight, and that peaceful elephants always try to avoid conflict. Suppose further that the above payoffs are correlated with fertility, i.e. that elephants who have greater access to food also have greater fertility.

a. If the elephant population consists mainly of war-like elephants, will war-like elephants or peaceful elephants reproduce at a faster rate?

b. If the elephant population consists mainly of peaceful elephants, will war-like elephants or peaceful elephants reproduce at a faster rate?

c. Solve for the long-run equilibrium fraction of the elephant population that is war-like.

Problem 6 (20 points (8, 7, 5)) Suppose that workers value their time anywhere between \$0/hour and \$50/hour, with every value between 0 and 50 being equally likely. A worker will take a job only if the wage is above the value of his time. Suppose that if a worker takes a job, he will generate revenue equal to 1.5 times the amount he values his time (that is, a worker who values his time at \$20/hour will generate $\$20*1.5 = \$30$ revenue for a firm each hour). Firms cannot how productive workers are before hiring them; all workers look identical.

a. Is there an equilibrium in which all workers are hired? If so, describe it (what wages are paid, which workers work). If not, is there an equilibrium in which any workers are hired?

b. What is the name for this economic phenomenon studied in this question?

c. Suppose workers become more productive, so that now when a worker is hired, he increases a firm's revenue by X times the amount he values his time (that is, a worker who values his time at \$20/hour will generate $\$20 * X$ dollars for a firm each hour). Would you get a different answer to part a if X were much larger? Explain why.