

## Finance 30210 Midterm #3 Practice Questions

- 1) Consider the following version of the prisoners dilemma game (Player one's payoffs are in bold):

		Player Two	
		Cooperate	Cheat
Player One	Cooperate	<b>\$15</b> \$15	<b>\$0</b> \$50
	Cheat	<b>\$50</b> \$0	<b>\$10</b> \$10

- a) What is each player's dominant strategy? Explain the Nash equilibrium of the game.
  - b) Why is an infinite horizon required for cooperation to occur? Explain.
  - c) Now, suppose that this game was played an infinite number of times. For what values of the interest rate is the present value of cooperating higher than the value of cheating (so that a cooperative equilibrium could occur)
- 2) Consider the following pricing game between Dell and Gateway. There are two types of demanders in the market, High and Low.

High demanders value a computer at \$4000. There are 100 of these people in the market.

Low demanders value a computer at \$1000. There are 200 of these people in the market.

If Dell and Gateway set the same price, they split the market. If they set different prices, the lower price takes the entire market. Assume that the marginal cost of a computer is \$500.

- a) Write the strategic form of the game (i.e. possible actions and payoffs). Assume that there are only two options for price \$4,000 or \$1000.
- b) What is each player's strategy? Explain the Nash equilibrium of the game.
- c) Suppose that Dell has the following beliefs about Gateway:

$$\Pr(P = \$4,000) = 2/3$$

$$\Pr(P = \$1,000) = 1/3$$

Can this strategy be consistent with a Nash equilibrium?

- d) Calculate the mixed strategy equilibrium for this game.
- e) What percentage of the time will computer prices be low?

- 3) Suppose that the elasticity of demand for tennis shoes is 4 (and is constant). Calculate the markup that would be charged if a monopoly controlled the market. How would your answer change if the market was oligopolistic with an HHI index of 5,000?

- 4) Suppose that the (inverse) demand curve for bananas is given by

$$P = 400 - 5Q$$

Where  $Q$  is total industry output. The market is occupied by two firms, each with constant marginal costs equal to \$5.

- a) Calculate the equilibrium price and quantity assuming the two firms compete in quantities. Calculate the elasticity of demand facing each firm. How does this differ from industry elasticity?
  - b) Repeat parts (a) assuming the competition is in prices rather than quantities.
  - c) Suppose that each firm was capacity constrained. That is, each firm can only produce 100 units. How does this change your answers to (b)?
- 5) Explain the similarities/differences between Cournot competition and Bertrand competition. What are the key assumptions/results of each?
- 6) Explain the following statement: "If firms are competing in quantities, then it pays to be the first to the market. However, if firms are competing in price, it is worthwhile to wait for your opponent to make his move"
- 7) What is the chain store paradox? What is the major lesson we get from this game?
- 8) Suppose that the probability of getting in an accident is 3%. The average cost of an accident is \$100,000. Suppose that the average car driver has preferences given by

$$U(I) = \sqrt{I}$$

- a) Assuming that this individual earns \$100,000 per year in income, calculate his expected utility if he buys no insurance.
- b) Calculate the cost of this policy for the insurance company.

- c) Suppose that half the population was made up of unsafe drivers (i.e. with a higher accident rate). How high would the unsafe driver's accident rate have to be for this market to break down?
- d) Explain how moral hazard and adverse selection are dealt with in the insurance industry.

9) Suppose that the market demand is described by

$$P = 120 - (Q + q)$$

Where  $Q$  is the output of the incumbent firm,  $q$  is the output of the potential entrant and  $P$  is the market price. The incumbent's cost function is given by

$$TC(Q) = 60Q$$

While the cost function of the entrant is given by

$$TC(q) = 60q + 80 \text{ (80 is a sunk cost paid upon entering the market)}$$

- a) If the entrant observes the incumbent producing  $\bar{Q}$  units of output and expects this level to be maintained, what is the equation for the entrant's residual demand curve?
- b) If the entrant maximizes profits using the residual demand in (a), what output will the entrant produce?
- c) How much would the incumbent have to produce to keep the entrant out of the market? At what price will the incumbent sell this output?