Name: **Key**

Econ 304—Bethany College

**Exam 03**

* There are 110 possible points on this exam. The test is out of 100.
* You have one hour to complete this exam, but you should be able to complete it in less than that
* Please turn off all cell phones and other electronic equipment.
* You are allowed a calculator for the exam. This calculator cannot be capable of storing equations. This calculator cannot double as a cell phone.
* Be sure to read all instructions and questions carefully.
* Remember to show all your work.
* Recall basic logic. “Water is wet” is a true statement. “Water is wet and leopards have stripes” is a false statement.
* *Please print clearly and neatly.*

**Part I: Multiple Choice.** *Choose the best answer to the following.*

4 points each.

1. In a monopoly diagram, what point does marginal cost always pass through?
   1. The intercept of the demand curve
   2. The inflection point of the marginal revenue curve
   3. The maximum point of the ATC curve
   4. B & C
   5. **None of the above**

*It passes through the* minimum *point of the ATC curve.*

1. Recall this visualization of the location model:

A

B

0

L

x

a

L-b

b

a

Which of the following is the net satisfaction of consumer x if she buys from Firm A (for simplicity, ignore all utility gained from consumption)?

* 1. **–pA – τ|x – a|**
  2. –pA – τ|x – (L – b)|
  3. –τ(pA –|x – a|)
  4. – τ(pA + |x – (L – b)|)
  5. None of the above

*Since you are buying from Firm A, you would reference the distance from x to a. The cost of transportation—τ—would not affect the price at Firm A.*

1. What model assumes firms set price?
2. Bertrand
3. Cournot
4. Stackelberg
5. B & C
6. None of the above

*Bertrand assumes this; the other two assume firms set quantity.*

1. Suppose a monopoly has a demand curve of P = 30 – Q and a total cost curve of 10 + 0.25Q2. What is the profit maximizing output?
2. 5
3. 10
4. **12**
5. 15
6. None of the above

*Setting MC = MR, or 30 – 2Q = 0.5Q, Q = 12.*

1. Printers and printer ink is example of tying. How does this example illustrate that tying is a form of price discrimination?
   1. **Different people pay different amounts for the ability to print**
   2. The same people pay different amounts for each unit of ink they buy
   3. Though everyone pays the same amount, everyone’s value of the component parts is so different; different prices occur in people’s heads.
   4. A & C
   5. None of the above

*If you think of buying printers and ink as buying the ability to print things, then different types of people, with different willingness to pay, pay different amounts. Option B is a reference to block pricing and option C is a reference to bundling.*

1. How is price matching (matching a competitor’s lower price) a form of price discrimination?
2. Because at certain times people are willing to pay more
3. Because some goods become more valuable the more you use them so a stripped-down version is offered at a very low price
4. **Only those sensitive enough to seek out a lower price will get a discount**
5. A & C
6. None of the above

*Price matching is a way to separate consumers into two segments: sensitive and insensitive ones. Only those who are sensitive to price are willing to go through the extra effort of making sure they get a good deal.*

1. Which of the following is ***not*** an example of price discrimination? (HINT: Think of the requirements of price discrimination.)
   1. Some goods cost less with coupons
   2. Airline tickets are cheap if you buy them well in advance
   3. **A car with excellent gas mileage cost more than one with poor gas mileage**
   4. A & B
   5. None of the above

*The requirements of price discrimination require the goods cost the same. A car with great mileage will clearly cost more than one with poor mileage.*

1. What do we assume in monopolistic competition?
2. There are barriers to entry.
3. **Products are heterogeneous.**
4. No deadweight loss.
5. A & B
6. None of the above.

*There is still deadweight loss in monopolistic competition and the shifting of the demand curve reflects that there are no barriers to entry. Products, however, are different, which is where their monopoly power comes from. (You could argue that there are barriers to entry for identical products, but not for similar ones; the actual exam will make that distinction clear if this question comes up.)*

**Part II: True/False.** *Answer true or false, and justify your answer.*

10 points each.

1. Monopolies use planned obsolescence to prevent competition with themselves, even with a robust secondary market.

*True. If goods break sooner, that damages the secondary market. While monopolies can recover that competition in the form of a higher initial price, durability is expensive to produce so profit margins decrease.*

1. An example of planned obsolescence is when programs are built to work with the best computer, necessitating consumers to purchase better computers.

*False, on several levels. For one, it assumes hardware manufacturers are conspiring with software engineers—which is quite the leap—and it assumes the market for either isn’t competitive. But is competitive and thus software engineers have an incentive to make software as useable as possible while still meeting consumer demands for performance. One could argue there’s some obsolescence on the hardware side, but such obsolescence is derived from patents (the monopoly power). Moreover, the object in question doesn’t break when something better comes out; at best this is obsolescence based on fashion rather than function.*

1. The location model can be used to explain why firms build brand identity.

*True. One can think of the model as figurative distance instead of literal distance, say the level of sugar content. By adding brand identity, the firm is making it more expensive to ‘travel’ to a different firm.*

**Part III: Short Answer.** *Answer the following.*

16 points each.

1. Consider a monopolistically competitive firm a demand curve of P = 30 – Q and a total cost curve of 4 + 0.25Q2. At what output does this firm produce zero economic profit? How much does the curve shift?

*30 – A – Q = (4 + 0.25Q2)/Q*

*30 – 4/Q – 1.25Q = A*

*30 – A – Q = 0.5Q = MC*

*30 – (30 – 4/Q – 1.25Q) – Q = 0.5Q*

*4/Q + 1.25Q – Q = 0.5Q*

*4/Q = 0.25Q*

*4/0.25 = Q2*

*4 = Q*

*A = 30 – 1 – 1.25 = 27.75*

1. Under a Bertrand model of monopolistically competitive firms, find the Nash Equilibrium using the information below (report both price and quantity for each firm).

Firm 1’s Demand: Q1 = 12 – 2P1 + P2

Firm 2’s Demand: Q2 = 12 – 2P2 + P1

Firm 1’s Total Costs: TC1 = 4 + 2Q1

Firm 2’s Total Costs: TC2 = 4 + 4Q2

*Π1 = (12 – 2P1 + P2)P1 – 4 – 2(12 – 2P1 + P2) =*

*16P1 – 2P12 + P1P2 – 28 – 2P2*

*16 – 4P1 + P2 = 0; (16 + P2)/4 = P1*

*Because total costs for the different firms are slightly different, we must go through that process again for Firm 2.*

*Π2 = (12 – 2P2 + P1)P2 – 4 – 4(12 – 2P2 + P1) =*

*20P2 – 2P22 + P1P2 – 52 – 4P1*

*20 – 4P2 + P1 = 0; (20 + P1)/4 = P2*

*(16 + (20 + P1)/4)/4 = P1*

*4 + (20 + P1)/16 = P1*

*0.25 + 1.25 + P1/16 = P1*

*1.5 = 15P1/16*

*(3/2)(16/15)= P1*

*8/5= 1.6 = P1*

*P1 = 1.6*

*P2 = 5.4*

*Q1 = 14.2 (note this is a bit strange because we are effectively charging a negative price)*

*Q2 = 2.8*

1. Consider a Stackelberg model with two Firms (A and B) share the following demand curve:

P = 48 – Q; Q = QA + QB

Assume the marginal cost of each firm is 12. Firm A goes first. What is the equilibrium *profit* for each firm?

*P = 48 – QA – QB*

*MRB = 48 – QA – 2QB*

*48 – QA – 2QB = 12*

*18 – 0.5QA = QB*

*P = 48 – QA – 18 + 0.5QA*

*MRA = 30 – 2QA + QA*

*30 – QA = 12*

*18 = QA;18 – 9 = 9 = QB*

*The market price for both is 48 – 18 – 9 = 21*

*ΠA = (21 – 12)18 = 162*

*ΠB = (21 – 12)9 = 81*