Intermediate Microeconomics
ECNS 301
Spring 2014

Exam #: 3
Version A

Tuesday April 29, 2014

Name: ________________________________

Instructions:

You must answer all of the following questions. Each question is worth the same amount. You have the class period to complete the exam.

Answer each question clearly and concisely. You must show your work to receive credit.

This exam is given under the rules of the Montana State University. By printing your name above you acknowledge the University’s Honor Code and agree to comply with the provisions of the Honor Code. You may not use notes or receive any assistance. There is to be no talking during the exam. You may use a calculator, but are never allowed to use device allowing you to take photographs or transmit over a network. No notes, no assistance, no talking, no cell phones, but you can use a calculator.

Clearly print your name above, in the space provided on the next page and in your blue book(s). You must turn in the exam and your blue book(s). There are two versions of the exam. Indicate your exam version on your blue book. It is your responsibility to make sure your version of the exam is different from the students next to you. If you have the same version as any of the students next to you, you will be asked to move.
True/False/Uncertain Plus Explanation

1. For each of the following, state whether it is true, false or uncertain and explain your answer. No points are given without explanation.

(a) Since there are no close substitutes for the monopoly’s product, the monopoly can charge any price it wishes.

(b) Producer surplus equals total revenue minus the sum of all marginal costs.

(c) A firm never produces at a price below their average cost.

(d) If neither firm has a dominant strategy, a Nash Equilibrium cannot exist.

Short Answer/Numerical

2. The inverse demand function for the market is $P = 120 - 2Q$. There are two firms: $A$ and $B$. The costs for firm $A$ are $C(q_A) = 18q_A$, and the costs for firm $B$ are $C(q_B) = 18q_B$. Assume that both firms choose quantities simultaneously.

(a) What is each firm’s strategic variable and what is firm $A$’s profit maximization problem as a function of each firm’s strategic variable?

(b) What is each firm’s best response function?

(c) How much does each firm produce at the Nash equilibrium?

(d) What is the market equilibrium price at the Nash equilibrium?
3. There are 80 consumers and each consumer has the following preferences for the goods $x$ and $y$

$$u(x, y) = \min \left\{ 2x, \frac{1}{12} y \right\}$$

and each consumer has an income level of $m = 144$. Firms produce good $x$ with the following production technology.

$$x = L^{\frac{1}{2}} K^{\frac{4}{3}}$$

$K$ is the amount of capital used in production which has a rental rate of $r = 12$ and $L$ is the amount of labor used in production with a wage rate of $w = 3$. Also, each firm that produces $x$ must pay $384$ for protection services. Firms product good $y$ with the following production technology

$$y = L + 2K$$

and firms that produce $y$ do not have to pay for protection services.

(a) What are the market demand curves for goods $x$ and $y$?

(b) What is a firm’s cost function for good $x$?

(c) What is a firm’s cost function for good $y$?

(d) If both markets are perfectly competitive, what are the market equilibrium prices and quantities?

(e) If both markets are perfectly competitive, how many firms product good $x$?

4. A firm’s production function is $q = K^2 L$ where $q$ is the quantity produced, $K$ is the amount of capital used, and $L$ is the amount of labor used. $w$ is the wage rate of labor and $r$ is the rental rate of capital.

(a) In the short run when capital is fixed, how much labor should the firm hire?

(b) In the short run when capital is fixed, what is the short run cost function?

(c) In the long run, how much labor and capital should the firm use?

(d) What are the long run costs?