Intermediate Microeconomics
ECNS 301
Spring 2013

Exam #: 2
Version A

Friday March 22, 2013

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) The change in total welfare from a 10% increase in price will depend only on the elasticity of demand.
   (b) The length of the short run is the same for all firms.
   (c) Unlike indifference curves, isoquants can intersect.
   (d) After employing her last laborer, Rachel notices that her Average Product has decreased. Her marginal cost is greater than her Average Variable Cost.

Short Answer/Numerical

2. Consider three consumers. All three buy bread (B) and cheese (C), and no other goods. The price of bread is $1 per loaf, and the price of cheese is $2 per pound. Each consumer has a weekly budget of $60. Given the information below, find the utility-maximizing combination of bread and cheese for each consumer and each consumer’s level of utility.
   (a) Stephanie’s utility function is \( U(B, C) = B^{1 \over 2} C^{1 \over 2} \).
   (b) Evan’s utility function is \( U(B, C) = \min\{B, C\} \). In other words, he likes 1 loaf of bread with 1 pound of cheese, and likes no other combination.
   (c) Ian doesn’t care whether he has bread or cheese as long as he has some food. These goods are perfect substitutes for him, and his utility function is \( U(B, C) = B + C \).

3. A firm’s production function is as follows.
   \[ q = KL + 10L \]
   (a) What is the marginal product of labor and the average product of labor?
   (b) What is an equation for any isoquant if \( K \) is on the vertical axis and \( L \) is on the horizontal axis?
   (c) Find the marginal rate of technical substitution as a function of just \( K \) and \( L \).
   (d) Does this production function exhibit increasing returns to scale, constant returns to scale or decreasing returns to scale and why?

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?