ECON 001
Fall 2019
Midterm 1
10/02/2019
Time Limit: 60 Minutes

Name (Print): _____

Recitation Section: _____

Name of TA: _____

- This exam contains 7 pages (including this cover page) and 10 questions. Check to see if any pages are missing.

- The exam is scheduled for 1 hour.

- This is a closed-book, closed-note, no calculator exam.

- Answer each multiple choice question by writing the correct answer on the line at the right margin of the corresponding question. Make sure that your answer is clearly written or it will be marked incorrect.

- Write your answers to the other questions in the spaces provided below them. If you don't have enough space, continue on the back of the page and state clearly that you have done so.

- Do not remove any pages or add any pages. No additional paper is supplied

- Show your work when applicable. Use diagrams where appropriate and label all diagrams carefully.

- You must use a pen instead of a pencil to be eligible for remarking.

- This exam is given under the rules of Penn's Honor system.

My signature certifies that I have complied with the University of Pennsylvania's Code of Academic Integrity in completing this examination.

Please sign here _____ Date _____

Question	Maximum	Grade
MC (Q1-8)	35	
1st SA (Q9)	35	
2nd SA (Q10)	30	
Total	100	

Multiple Choice Questions (best 7 out of 8: 35 points)

1. (5 points) Carolyn needs to provide care for her ailing parents. She can either quit her job and move in to their house to take care full time, or put them in a nursing home and keep her current job, which pays $130,000. The nursing home would cost her $60,000. She knows her parents would not like the nursing home and she values the benefit of not sending them there at $50,000. Is it a rational decision to quit her job and take care of her parents, and why?

   A. No, because the benefit of that decision is $50,000 and its opportunity cost is $60,000.
   B. No, because the benefit of that decision is $50,000 and its opportunity cost is $70,000.
   C. No, because the benefit of that decision is $50,000 and its opportunity cost $130,000.
   D. No, because the benefit of that decision is $50,000 and its opportunity cost $190,000.

   1. ——————

2. (5 points) While attempting to permanently cut all cell phone service in DRL, one of Penn's Physics Professors accidentally released an Electromagnetic Pulse (EMP) that burned out all of the bulbs in every lamp from 30th to 40th street on Penn's campus. How does this affect the equilibrium price and/or equilibrium quantity in the Philadelphia bulb market?

   A. Equilibrium quantity will decrease; Equilibrium price will increase
   B. Equilibrium quantity will increase; Equilibrium price will increase
   C. Equilibrium price will decrease; the effect on equilibrium quantity is indeterminate
   D. Equilibrium quantity will increase; the effect on equilibrium price is indeterminate

   2. ——————

3. (5 points) Which of the following could increase the price for Coca-Cola?

   A. A decrease in the price of orange juice, a substitute for Coke
   B. New farming equipment makes it easier to farm corn, which is used to produce high fructose corn syrup, a major input in soda production
   C. An increase in consumer income, under the assumption that Coca-Cola is an inferior good
   D. An accident at the main Coca-Cola bottling facility that results in lower production

   3. ——————

4. (5 points) Consider the perfectly competitive market for eggs, where demand is $Q_D = 20 - P$ and supply is $Q_S = 3P$ (where P is the price of eggs). If the mechanization of poultry farms reduces the cost of producing eggs, what happens to consumer's expenditure on eggs in equilibrium?

   A. It increases   B. It decreases   C. It does not change   D. Not enough information to tell

   4. ——————

5. (5 points) Which of the following statement(s) regarding the slope (in absolute value) of the budget constraint is true?

    I. It is always equal to the consumer's marginal rate of substitution between good x and good y.

    II. It reflects the opportunity cost of good x (the quantity of which is depicted on the horizontal axis) in terms of good y (the quantity of which is depicted on the vertical axis).

    III. It is the relative price of good x in terms of good y.

A. I only   B. II only   C. III only   D. I and II
E. I and III   F. II and III   G. I, II and III   H. None

5. ——————————

6. (5 points) When the price of bananas is \$1 per pound while the price of apples is \$2 per pound, Angela consumes 6 bananas and 4 apples. A new pesticide causes the supply of apples to significantly increase, which sharply decreases their price to \$1 per pound. Angela's new optimal consumption bundle after the price change consists of 4 bananas and 10 apples. We also know that the bundle of goods that would have been chosen at the new prices while maintaining Angela's utility experienced before the price change is 5 bananas and 6 apples. What is the income effect of the chnge in the price of apples on Angela's consumption of apples?

A. 2   B. 6   C. 4   D. -4

6. ——————————

7. (5 points) A survey of fruit consumed by Penn students shows that when peaches cost \$5, 100 peaches are demanded. When peaches cost \$3, 200 peaches are demanded. Which of the following statements is true about the demand for peaches between these two prices?

A. It is elastic
B. It is inelastic
C. It is unit-elastic
D. Not enough information.

7. ——————————

8. (5 points) Sandy owns a firm in a competitive market for fried chicken sandwiches. Sandy's total cost for producing fried chicken sandwiches is $TC(q) = 10q^2 + 5q + 40$, while her marginal cost is $MC(q) = 20q + 5$, where q is the number of sandwiches produced. Suppose all fixed costs are sunk. If the market price of fried chicken sandwiches is \$4 per sandwich, then:

A. Sandy makes a positive profit and should operate in the short run.
B. Sandy makes a positive profit and should shut down in the short run.
C. Sandy makes a negative profit and should operate in the short run.
D. Sandy makes a negative profit and should shut down in the short run.

8. ——————————

Short Answer Questions (65 points total)

To get any point you must show your work

9. Scott, a Penn student, likes to have muffins and apples for breakfast. He always eats them together, in the same ratio: with every apple he eats, he also eats two muffins. At the farmers' market outside Penn Bookstore, he can purchase each apple for $P_A = \$1$.

   (a) Scott's budget line is shown in the figure below, where apples are on the x axis and muffins are on the y axis. What is Scott's income? What is the price of a muffin P_M?
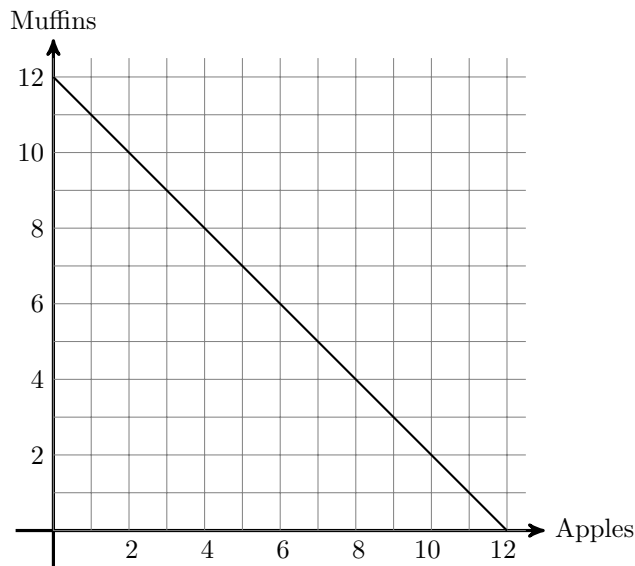
   (b) In the graph above, draw three indifference curves for Scott passing through the points $(4, 4)$, $(6, 6)$ and $(8, 8)$.

   (c) Given Scott's budget constraint and preferences, what is his optimal consumption of apples and muffins?

   (d) After a bad crop in Pennsylvania, the price of apples goes up to \$2 / apple at the farmer's market. Plot Scott's new budget constraint. What is his new optimal consumption of apples and muffins?

(e) What is Scott's price elasticity of demand for apples between the two prices? Is his demand for apples elastic, unit-elastic or inelastic? Show your work.

(f) Consider the substitution and income effects associated with the increase in the price of apples.

    i. Compute the change in the consumption of apples and muffins resulting from the substitution effect, if any.

    ii. Compute the change in the consumption of apples and muffins resulting from the income effect, if any.

    iii. Are muffins and apples normal or inferior goods, and why?

(g) One day, Scott finds a worm in his apple. Disgusted, he starts to hate apples. For every apple he consumes, he now needs to consume exactly one muffin to compensate for the dis-utility of eating the apple and remain as well off. In the graph below, draw the indifference curve that goes through the point $(6, 6)$.

Muffins M
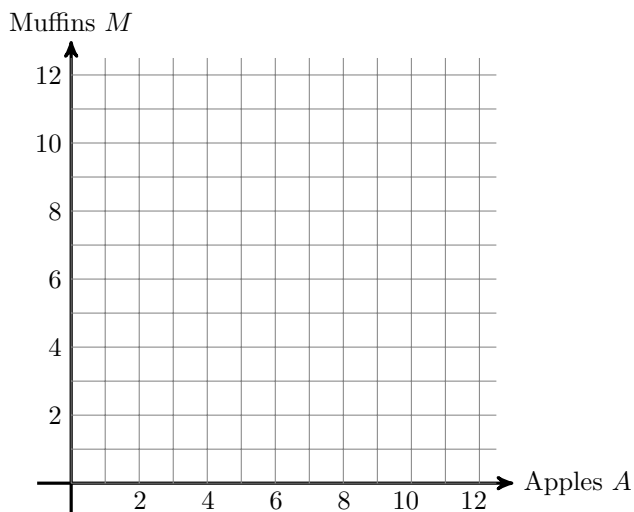
10. Suppose that the market for avocados is perfectly competitive. Market demand given as: $Q_D = 1,200 - 10P$, where Q_D is the quantity demanded in pounds and P is the price in dollars. There are 20 identical farmers in the market and each farmer has a (sunk) fixed cost $FC = 100$, a variable cost $VC(q) = 40q + q^2$ and a marginal cost $MC(q) = 2q + 40$, where q is the quantity of avocados produced in pounds.

(a) Find the shut-down price and the equation of the short-run supply curve of an avocado producer.

(b) Derive the short-run market supply curve, Q_S.

(c) In the figure below, draw the market supply and market demand for avocados. Find the equilibrium price P^* and the equilibrium quantity Q^*.

P

0   Q
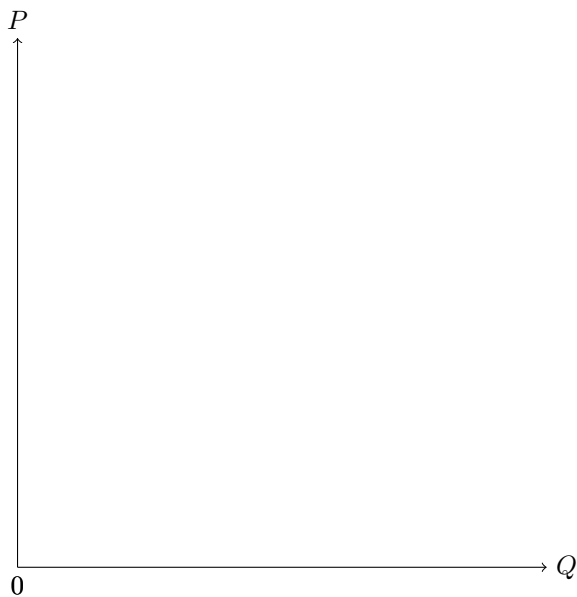
(d) Compute the market consumer surplus, producer surplus and total surplus in equilibrium.

(e) Find the (individual) producer surplus of each farmer in equilibrium. Will farmers enter or exit the market in the long run, and why?

(f) Find the market price P_{LR}, the market quantity Q_{LR}, the indvidual quantity q_{LR} and the number of firms in the long-run equilibrium.