ECON 001
Fall 2021
Midterm
October 12, 2021
Time Limit: 60 Minutes

Name (Print): _____

Penn ID number: _____
(8 digits)

_____

- 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.

- The total score is 24 points.

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

- Answer each multiple-choice question by filling in the bubble for the answer you select. Make sure that the bubble is clearly filled in, or it will be marked incorrect.

- Write your answers to the short answer questions in the spaces provided for them. Do not write your answers outside of the boxes.

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

- Show your work when asked. Label all graphs carefully.

- 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 _____

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

1. (1 point) Marie has two options for her Friday night. She can either go to a concert, or work for an hour and then meet her friends at a restaurant. She values the concert at $300, and she got the ticket for free, but she will have to pay a $50 taxi fare to get there. If she doesn't go to the concert, she can resell the ticket for $150. Her job pays $150 per hour of work. If she eats out with her friends, it will cost her $100 and she will get $200 of benefit. What is the opportunity cost of going to the concert?

   ○ $300

   ○ $350

   ○ $400

   ○ $450

2. (1 point) The market for toilet paper has downward sloping demand and upward sloping supply. At the beginning of COVID outbreak, households started stockpiling toilet paper. In response, many firms entered the market and started producing toilet paper. As a result of these changes, which of the following must be true about the new market equilibrium?

   I. Equilibrium price of toilet paper increased.

   II. Equilibrium quantity of toilet paper increased.

   ○ I. only

   ○ II. only

   ○ Both I. and II.

   ○ Neither I. nor II.

3. (1 point) The market for refined cane sugar is perfectly competitive and characterized by demand $Q_D = 1 - P$ and supply $Q_s = P$. Suppose the price of raw cane sugar, an input for refined cane sugar production, decreases. Which of the following is a consequence of this change in the cane sugar market?

   I. Consumer Surplus increases.

   II. Producers' total revenue increases

   ○ I. only

   ○ II. only

   ○ I. and II.

   ○ Neither I. nor II.

4. (1 point) Alice always consumes 1 cup of coffee with 1 cookie. Her income is $12, the price of a cup of coffee is $3 and the price of a cookie is $3. Suppose the price of a cup of coffee falls to $2 while the price of a cookie increases to $4. What happens to her optimal consumption of cookies?

   ○ Her optimal consumption of cookies increases.

   ○ Her optimal consumption of cookies decreases.

   ○ Her optimal consumption of cookies remains the same.

   ○ Not enough information.

5. (1 point) Martin's meals at Biscuit Casket consist of two items, fried catfish and key-lime pie. A new regulation is passed restricting fishing permits, reducing the total number of catfish that may be caught. As a result, Martin consumes less key-lime pie. We may thus conclude that:

○ Martin's income elasticity of key-lime pie is negative.

○ Martin's cross-price elasticity of key-lime pie with respect to catfish is negative.

○ Key-lime pie is price inelastic for Martin.

○ Catfish is price inelastic for Martin.

6. (1 point) The market for oil has a linear, upward-sloping supply curve. Oil producers stop producing any barrels if the price is less than \$10 per barrel. The supply of oil is:

○ Elastic

○ Inelastic

○ Unit elastic

○ Not enough information

7. (1 point) Consider the market for coffee mugs. The market is perfectly competitive and in long-run equilibrium. Each firm currently produces 10 mugs and the market demand is given by $Q_d = 1000 - 100P$, where the price is in dollars per cup. If there are 50 identical firms in the market, what is the each firm's total cost of producing 10 mugs?

○ \$10

○ \$20

○ \$50

○ \$100

○ Not enough information to tell.

8. (1 point) Jenna and Kate are contemplating starting a business together under three different business models: B1, B2, and B3. Jenna and Kate have different types of skills which are utilized to varying proportions under the three models. Each person will be compensated according to their contribution. The table below shows Janna's and Kate's compensations with each business model.

|	Jenna	Kate
B1	4,000	2,900
B2	4,200	2,700
B3	3,000	3,000

Which business model is not Pareto efficient?

○ B1 is not Pareto efficient

○ B2 is not Pareto efficient

○ B3 is not Pareto efficient

○ All business models are Pareto efficient

Short Answer Questions (17 points total)

To get any point you must show your work

9. Minerva can purchase two goods, tea and biscuits, which are graphed on the x-axis and y-axis of the graph below. Her income is $24, the price of a biscuit is $2, and the price of tea is $3. Her initial optimal consumption bundle is point A.
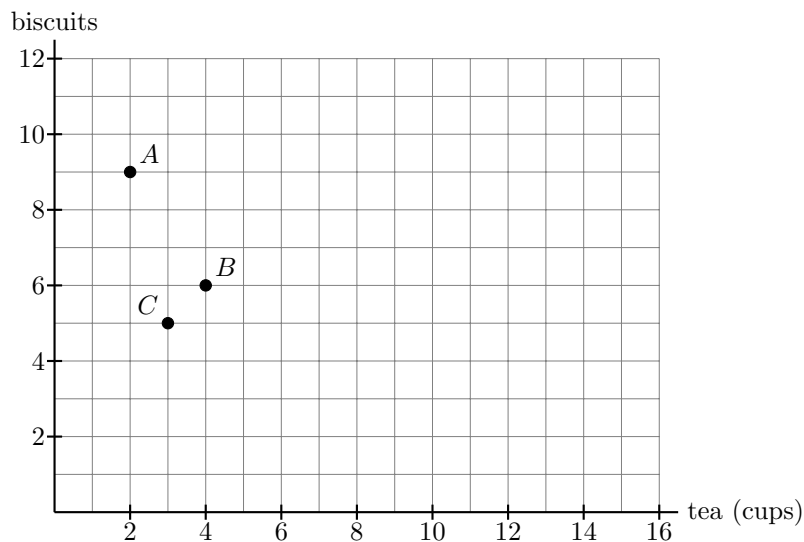
biscuits

(a) Suppose that due to price volatility in the market, the price of biscuits increases to $3 and the price of tea drops to $1.50. Minerva's new optimal consumption bundle is B. What is the impact of these changes on Minerva's utility? Explain in the box below. *(Hint: it might help to draw Minerva's budget lines)*

Bad weather conditions decrease the supply of tea so that the price of tea increases from $1.50 to $3, while the price of biscuits stays the same at $3, and her income is still $24. After the increase in the price of tea, Minerva's optimal consumption bundle changes from B to C.

(b) Can biscuits be an inferior good in this price range? *Explain in the box below.*

Biscuits _____ *(can be/ cannot be)* an inferior good.

(c) When the price of tea increases from $1.50 to $3, what is Minerva's price-elasticity for tea? Is her demand for tea elastic, unit-elastic, or inelastic? *Show your computations in the box below your answer. You can leave your answer as a fraction.*

The price elasticity of demand for tea is equal to (-)_____ so her demand is _____.

(d) Are the two goods substitutes or complements for Minerva? *Explain in the box below.*

(e) As the price of tea increases from $1.50 to $3 and Minerva's optimal consumption bundle changes from B to C, what happens to Minerva's marginal utilities of tea and of biscuits? *(write increases/decreases/stays the same)*

- Minerva's marginal utility of tea _____.
- Minerva's marginal utility of biscuits _____.

(f) What is Minerva's marginal rate of substitution between tea and biscuits at point C?

Minerva's marginal rate of substitution is $MRS_{xy} = (-)$ _____.

10. In Wizard Land, producers of flying broomsticks compete in a perfectly competitive market. Each firm faces the following costs: $TC(q) = q^2 + 2q + 4$ and $MC(q) = 2q + 2$, where all costs are in dollars.

(a) Initially, the market for broomsticks is in the short-run equilibrium and there are 30 producers. Suppose the market price is $4 per broomstick. *Show your work in the box below.*

- The quantity supplied by the market is $Q_S =$ _____ broomsticks.

- Each firm's profit is $\pi =$ _____ dollars.

(b) Suppose the market for broomsticks is now in the long-run equilibrium, after firms have been able to enter or exit. The market demand is given by $Q_D = 50 - 5P$. In the long-run equilibrium (*Show your work in the box below*):

- Each firm produces $q_{LR} =$ _____ broomsticks.

- Price is $P_{LR} =$ _____ dollars.

- The market quantity is $Q_{LR} =$ _____ broomsticks.

- The number of firms is $N_{LR} =$ _____ firms.

- Each firm's profit is $\pi_{LR} =$ _____ dollars.

- Total Producer Surplus in the market is $PS_{LR} =$ _____ dollars.

The graphs below represent the long-run equilibrium you found in part b, with the market for broomsticks on the left hand side, and the representative firm on the right hand side. The left hand side shows the market demand and market supply for broomsticks:
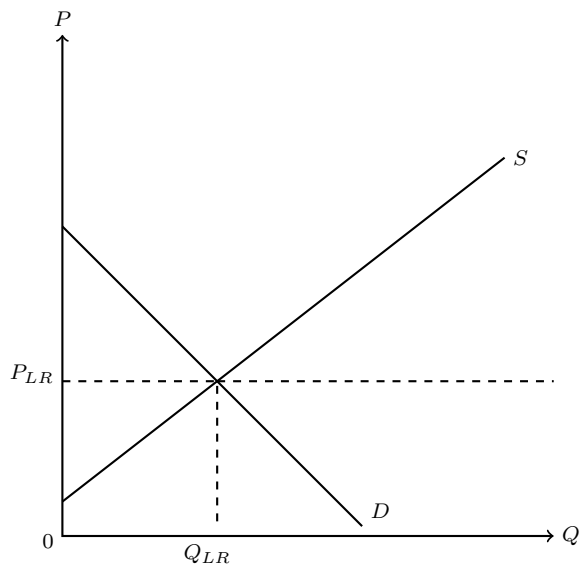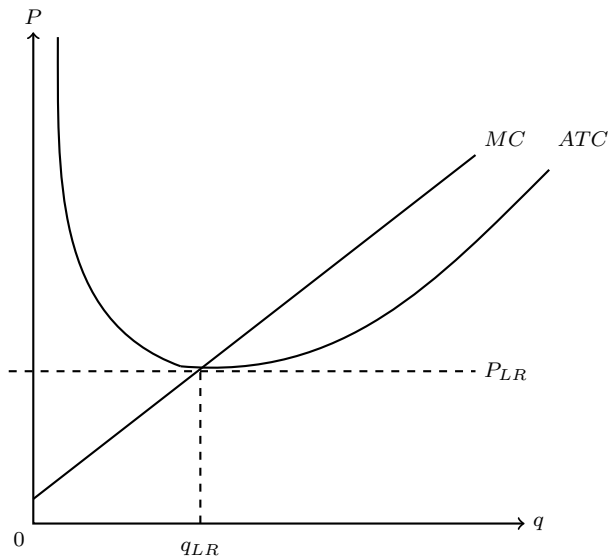
Figure 1: **Market**

Figure 2: **Individual Firm**

(c) Suppose the price of magic wands, which wizards use as a complement to broomsticks, decreases. In the graphs above, show how this change will affect the market and the representative firm. In particular, show:

- The change from initial equilibrium (P_{LR}, Q_{LR}) to the new short-run equilibrium (P_{SR}, Q_{SR})

- The change from the short-run equilibrium (P_{SR}, Q_{SR}) to the new long-run equilibrium (P', Q')

If you compare the new long-run equilibrium (P', Q') with the initial long-run equilibrium (P_{LR}, Q_{LR}) *(write increased / decreased / stayed the same, and explain these changes in words in the box below:)*:

- The number of firms has _____

- The price has _____

- The market quantity has _____

- Each firm's profit has _____