First Midterm Examination

You have two hours and forty minutes. Please write on examination sheets.

Part I. Answer as directed. All questions in this part have equal weight. This part of the test counts two-thirds of the points.

1. England and Scotland both produce scones and sweaters. Suppose that an English worker can produce 60 scones per hour or 4 sweaters per hour. Suppose that a Scottish worker can produce 30 scones per hour or 3 sweaters per hour.

   a. Which country has the absolute advantage in the production of each good? Which country has the comparative advantage in the production of each good? Briefly explain.

   b. If England and Scotland decide to trade, which commodity will Scotland trade to England? Explain.

   c. If a Scottish worker could produce only 2 sweaters per hour, would Scotland still gain from trade? Would England still gain from trade? Explain.
2. Because peanut butter and jelly are often eaten together, they are complements. Assume both commodities are produced in competitive markets with supply and demand curves that have the usual shape. We observe that the price of peanut butter and the quantity of jelly have both increased. Two possible explanations have been proposed: a) a fall in the price of peanuts; and b) a fall in the price of fruit juice (an input into the production of jelly). Only one of these stories is consistent with the facts. Which one is it? Draw two demand and supply diagrams (one for pb and one for jelly), to illustrate your answer.
3. Assume the market for minivans can be described using standard demand and supply curves. For each of the events listed here, indicate which of the determinants of demand or supply are affected. Also indicate whether demand or supply is increased or decreased.

a. People decide to have more children.
   Circle one: D  S  Circle one: Increase (shift to right)  Decrease (shift to left)

b. A strike by steelworkers raises steel prices.
   Circle one: D  S  Circle one: Increase (shift to right)  Decrease (shift to left)

c. Engineers develop new automated machinery for the production of minivans.
   Circle one: D  S  Circle one: Increase (shift to right)  Decrease (shift to left)

d. The price of station wagons increases.
   Circle one: D  S  Circle one: Increase (shift to right)  Decrease (shift to left)
4. Explain why the following might be true: A drought around the world raises the total revenue that farmers receive from the sale of grain, but a drought only in Kansas reduces the total revenue that Kansas farmers receive.
5. The government has decided that the free-market price of cheese is too low.

   a. Suppose the government imposes a *binding* price floor in the cheese market. Use a demand and supply diagram for cheese to show the effect of this policy on the price of cheese and the quantity of cheese sold. Is there a shortage or a surplus of cheese?

   ![Demand and supply diagram for cheese](image)

   b. Farmers complain that the price floor has reduced their total revenue. Is this possible? Explain.

   c. In response to farmers' complaints, the government agrees to purchase all of the surplus cheese at the price floor price. Compared to the basic price floor, who benefits from this new policy? Who loses? Briefly explain.
6. The price of computers has fallen substantially over the past decade. Use a supply and demand diagram to show the effect of falling production costs (caused, perhaps, by technological improvements in the production of computers) on the price and quantity of computers sold. (Assume supply and demand curves have the usual shapes.) In your diagram, show what happens to consumer surplus and producer surplus.
7. Suppose the government imposes a tax on heating oil.
   a. Is the *deadweight loss* from this tax likely to be greater in the first year after it is imposed or in the fifth year? Explain.

b. Is the *revenue* collected from this tax likely to be greater in the first year after the tax is imposed or in the fifth year? Explain.
8. The U.S. represents a small part of the world pineapple market.

a. Draw a diagram depicting the equilibrium in the U.S. pineapple market without international trade. Identify the equilibrium price, equilibrium quantity, consumer surplus, and producer surplus.

b. Suppose the world price is below the US. price before trade, and that the U.S. market is now opened to trade. Identify the new equilibrium price, quantity consumed, quantity produced domestically, and quantity exported or imported. Also, show the change in the surplus of domestic consumers and producers. Has domestic total surplus increased or decreased? Explain.
9. Your cousin Vinnie owns a painting company with a total fixed cost of $200, and the following schedule for total variable cost:

<table>
<thead>
<tr>
<th>Quantity of Houses Painted Per Month</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Variable Cost</td>
<td>$10</td>
<td>$20</td>
<td>$40</td>
<td>$80</td>
<td>$160</td>
<td>$320</td>
<td>$640</td>
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<tr>
<td>AFC</td>
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<td>AVC</td>
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<td>ATC</td>
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</tbody>
</table>

Calculate Average Fixed Cost, Average Variable Cost, and Average Total Cost for each quantity. (Show work.) What is the "efficient scale" (as Mankiw calls it) of the painting company? Briefly explain.

10. The licorice industry is competitive. Each firm produces 2 million strings of licorice per year. Given the quantity produced, the strings have an average total cost of $.20 each; they sell for $.30 each. The industry is in short run equilibrium.

   a. What is the marginal cost of a string? Briefly explain.

   b. Is this industry in long run (as well as short run) equilibrium? Explain.
11. Define a firm's *Marginal Revenue*. If the price of a good is always greater than zero, can a monopolist's marginal revenue ever be negative? Carefully explain, using the definition of Marginal Revenue.
12. A large share of the world supply of diamonds comes from Russia and South Africa. Suppose that the marginal cost of mining diamonds is $1,000 per diamond, and the demand for diamonds is described by the following schedule:

<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>$8,000</td>
<td>5,000</td>
</tr>
<tr>
<td>7,000</td>
<td>6,000</td>
</tr>
<tr>
<td>6,000</td>
<td>7,000</td>
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<tr>
<td>5,000</td>
<td>8,000</td>
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<tr>
<td>4,000</td>
<td>9,000</td>
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<td>3,000</td>
<td>10,000</td>
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<tr>
<td>2,000</td>
<td>11,000</td>
</tr>
<tr>
<td>1,000</td>
<td>12,000</td>
</tr>
</tbody>
</table>

a. If there were many suppliers of diamonds, what would be the price and quantity? Briefly explain.

b. If there were only one supplier of diamonds, what would the price and quantity be? Briefly explain.

c. If Russia and South Africa formed a cartel, what would be the price and quantity? If the countries split the market evenly, what would be South Africa's production and profit? What would happen to South Africa's profit if it increased its production by 1,000 while Russia stuck to the agreement?

d. Use your answer to part c to explain why cartel agreements are often not successful.
13. Sparkle is one of many in the market for toothpaste, which is in long-run equilibrium.

   a. Draw a diagram showing Sparkle's demand curve, marginal-revenue curve, average-total cost curve, and marginal cost curve. Label Sparkle's profit-maximizing output and price.

   b. What is Sparkle's profit? Explain.

   c. On your diagram, show the consumer surplus derived from the purchase of Sparkle toothpaste. Also show the deadweight loss relative to the efficient level of output. Explain.

Part II of the exam begins on the next page, which is numbered 1. There are 52 multiple choice questions in part II. Circle the letter of the one best answer. This portion of the exam counts one-third of the total score.