ECON 1101 - Midterm #2 Practice Problems Solutions

Question #1

Suppose that there is a small country known as Econland. Now let’s open up Econland to the world economy. Suppose the world price of widgets is $2. Since we are assuming that Econland is small relative to the world market, its trade policy will have no effect on the world price. The domestic demand and supply for widgets is given in the graph below.

(a) Suppose there is a total ban on widget imports. (This is like setting an import quota equal to 0.) What is the equilibrium widget price in Econland?

The equilibrium price is $5. This denoted by point A

(b) Suppose that the ban on widget imports is lifted. What quantity of widgets would be produced and consumed in Econland?

The World Price of $2 is denoted by the red line. The quantity consumed is 8 widgets, and is denoted by point D which is where the demand curve crosses the world price line. The quantity produced is 2 widgets, and is denoted by point C which is where the supply curve crosses the world price line.
(c) What is the loss in total Econland surplus from the import ban relative to the free market?

**Without Trade**

In the No Trade Case we can calculate Total Surplus as follows

\[
CS = \frac{1}{2}bh = \frac{1}{2}(5 - 0)(10 - 5) = (.5)(5)(5) = $12.5
\]

\[
PS = \frac{1}{2}bh = \frac{1}{2}(5 - 0)(5 - 0) = (.5)(5)(5) = $12.5
\]

\[
TS = CS + PS = $25
\]
With Trade

In the No Trade Case we can calculate Total Surplus as follows

\[ CS = \frac{1}{2}bh = \frac{1}{2}(8 - 0)(10 - 2) \]
\[ = (.5)(8)(8) = $32 \]

\[ PS = \frac{1}{2}bh = \frac{1}{2}(2 - 0)(2 - 0) \]
\[ = (.5)(2)(2) = $2 \]

\[ TS = CS + PS = $34 \]

Therefore, the loss in Total Surplus when you impose and import ban is $34 - $25 = $9
(d) What are the two reasons why the total Econland surplus declines when we compare the case of the import ban to the free trade case?

We can think of this as having two parts, as labeled as (1) and (2) on the previous graph.

Part (1) Is the loss from inefficient production. The units being produced domestically in this range all cost more than $2 to produce. If the goods are imported, Econland only has to pay $2.

Part (2) Is the loss from inefficient consumption. The consumers of these units can not purchase the widget because of the higher price.
Pam consumes pizza and soda. She has an income of $100. The price of pizza is $p_{\text{pizza}} = $10 and the price of soda is $p_{\text{soda}} = $5. Her indifference curves are illustrated in the graph below.

(a) Illustrate Pam’s budget constraint in the figure above and label it BC 1. Provide an interpretation of the slope of the budget constraint.

This is the black line in the graph above. The slope of the budget constraint is the ratio of prices and gives you the actual tradeoff a consumer would make between Pizza and Soda.

(b) Illustrate Pams optimal consumption bundle in the graph above, by labeling it point A. At the optimal consumption bundle, how many pizzas and sodas does Pam consume?

At the point A we can see that Pam would consume 5 Pizzas and 10 Sodas.

(c) What is the marginal rate of substitution at Point A (you found this in part (b)).

We know that at the optimal consumption bundle the slope of the budget line (the black line) is equal to the marginal rate of substitution. Thus, the MRS at point A equals 2 sodas for one pizza.
(d) Suppose the price of pizza rises to $p_{pizza} = 50. Illustrate the new budget constraint and label it BC 2. Label Pam’s new optimal consumption bundle point C. At the new higher price of pizza how many pizzas and sodas does Pam consume?

This is the red solid line in the graph above. At the point C we can see that Pam would consume 1 Pizzas and 10 Sodas.

(e) Breakdown the movement from A to C from the price change into a substitution effect (a movement from point A to an appropriate point B) and an income effect (which will be the movement from point B to point C). Label the optimal consumption choice at BC 3 as point B.

BC3 is the red dotted line on the graph above.
Question #3

Consider an economy with two agents, Argentina and Brazil. The economy only produces two goods, coffee and sugar. Argentina and Brazil can produce the goods as follows:

<table>
<thead>
<tr>
<th></th>
<th>Coffee</th>
<th>Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>4 hours/unit</td>
<td>2 hours/unit</td>
</tr>
<tr>
<td>Brazil</td>
<td>6 hours/unit</td>
<td>4 hours/unit</td>
</tr>
</tbody>
</table>

(a) Fill in the following table, computing the opportunity cost of production of each good for each country:

<table>
<thead>
<tr>
<th></th>
<th>Coffee</th>
<th>Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>2 units of Sugar</td>
<td>$\frac{1}{2}$ units of Coffee</td>
</tr>
<tr>
<td>Brazil</td>
<td>$\frac{3}{2}$ units of Sugar</td>
<td>$\frac{2}{3}$ units of Sugar</td>
</tr>
</tbody>
</table>

Note: To get this table you can assume that there are only 60 Total Hours each country has, you can pick any number for total hours you will still get the same answer but 60 hours will make the math a little easier. Or you can ask the question to get one more unit of coffee how many units of sugar would I have to give up?

(b) Who has the absolute advantage in the production of coffee? Why?

Argentina has the absolute advantage in the production of coffee because they use fewer resources to produce one unit of coffee.

(c) Who has the comparative advantage in the production of coffee? Why?

Brazil has the comparative advantage in the production of coffee because they have a lower opportunity cost.

(d) Consider the price of coffee in terms of sugar. What is the highest price at which coffee can be traded that would make both countries better off? What is the lowest price? Explain.

The highest price coffee will be traded for is 2 units of Sugar, because any higher and Argentina would not be willing to buy Coffee because they can produce it for less. The lowest price of coffee will be traded for is $\frac{3}{2}$ units of Sugar because any lower and Brazil would not be willing to trade because they are selling the coffee for less then what it cost them to make it.
Question #4

Consider the following PPF.

(a) Fill in the Blank: The Opportunity Cost of Good X is $\frac{2}{3}$.

(b) Fill in the Blank: The Opportunity Cost of Good Y is $\frac{3}{2}$.

(c) Circle ALL bundles that are attainable: Answers are highlighted in blue.

  \begin{align*}
  U & \quad V & \quad W & \quad X & \quad Y & \quad Z \\
  \end{align*}

(d) Circle ALL bundles that are unattainable: Answers are highlighted in blue.

  \begin{align*}
  U & \quad V & \quad W & \quad X & \quad Y & \quad Z \\
  \end{align*}

(e) Circle ALL bundles that are efficient: Answers are highlighted in blue.

  \begin{align*}
  U & \quad V & \quad W & \quad X & \quad Y & \quad Z \\
  \end{align*}

(f) Circle ONE: TRUE / FALSE

  The following technology process: Individual requires 2 hours to produce each unit of X, and 3 hours to produce each unit of Y, could result in the above PPF.

  True, if you had 30 Total hours then we would have the PPF described above.
Question #5

Suppose Sara’s income is $60. Only two goods exist for Sara, junk food and gasoline. Junk food costs $2 per unit and gasoline costs $4 per unit.

(a) Construct Sara’s budget constraint (put junk food on the Y-axis).

Point A is the OCB and is the tangent point of the Blue budget constraint (BC1) and Blue Indifference curve (IC1).

(b) Illustrate Sara’s optimal consumption bundle (using indifference curves like those seen in class).

(c) Now suppose the price of gasoline decreases to $2 per unit. Assume that junk food is an inferior good for Sara and gasoline is a normal good for Sara. Using this information, graphically illustrate the effects of this price change using the diagram above. Clearly illustrate the income and substitution effects.

The red dotted line is BC3, while the red solid line is BC2, and the Black curve is IC2.

The Substitution effect is from Point A to Point B

The Income effect is from Point B to Point C

The Total effect is from Point A to Point C.