SUID:

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Exam 1
Fall 2017

DO NOT OPEN THIS EXAM UNTIL YOU ARE TOLD TO DO SO.

Instructions

1. Write your SUID in the upper right corner of this exam. Do NOT write your name.

2. SHOW ALL YOUR WORK. Answers without supporting work will receive little or no credit.

3. There are 75 points possible on this exam and you will have 80 minutes to complete it. *Be sure to budget your time accordingly.*

4. Do all your work on this exam. If you need extra space, write on the backs of the pages. However, if you do write an answer on the back of a page, *be sure you've noted that near the question*.

Area of a triangle: $\frac{1}{2}bh$ Area of a trapezoid: $\left(\frac{b_1 + b_2}{2}\right)h$

Part 1 (30 points)

A good is purchased by 120 households of type X, 60 households of type Y, and it is produced by 80 sellers of type Z. The WTP and WTA curves for an individual household or seller of each type are shown below.

Individual X household: $WTP_{Xi} = 200 - 2 * Q_{Xi}$
Individual Y household: $WTP_{Yi} = 300 - 3 * Q_{Yi}$
Individual Z seller: $WTA_{Zi} = 2 * Q_{Zi}$

In addition, it is known that X households each have an income of $45,000 per year and that Y households each have an income of $65,000 per year.

(a) *15 points.* Please compute: ☐ the market equilibrium price and quantity; ☐ the quantity purchased by an individual X household; ☐ the quantity sold by an individual seller; and ☐ illustrate the market equilibrium with an appropriate graph.

Part 1, continued

Now suppose the government announces a tax of $36 on the good.

(b) *15 points.* Please compute: ☐ the new buyer and seller prices and equilibrium market quantity; ☐ the change in CS received by an individual X household; ☐ the tax burden on an individual household of each type; and ☐ indicate whether the tax is regressive or progressive, including any necessary calculations.

Part 2 (15 points)

Two companies that manufacture solar cells in the US have recently asked for a substantial tariff to protect them from foreign competition. On the surface, this sounds like a policy to protect the jobs of US workers. However, the main consumer of solar cells is the solar installation industry, and it employs far more workers than solar manufacturing. This question explores a stylized version of the issue.

The current price of solar cells is $0.35 per unit and no tariff is in place. US producers (U) supply 2 billion units, and total US demand is 15 billion units. You may assume that: foreign producers (F) have a perfectly elastic supply with $WTA_F = \$0.35$; US producers have a supply elasticity of 1; and the elasticity of demand in the US market is -2/3. The companies are requesting a tariff of $0.35.

(a) *15 points*. Please determine what will happen in the domestic market if the tariff is imposed. Calculate: ☐ the new equilibrium price and total quantity consumed; ☐ the new quantities produced by U and imported by F; ☐ the change in CS; ☐ the change in U's PS; ☐ the change in government revenue; and ☐ the overall change in SS from the policy. Finally, about 35,000 people work in solar manufacturing and 225,000 work in installation. Assuming that manufacturing employment is proportional to manufacturing output, and that installation employment is proportional to total demand, please determine: ☐ the net impact of the policy on employment.

Part 3 (15 points)

Suppose that consumption of a good creates a positive externality. The market WTP and WTA curves for the good are given below, as is the MB curve for the externality. Initially there is no tax or subsidy.

$$WTP = 600 - 3 * Q$$
$$WTA = 100 + 2 * Q$$
$$MB_{ext} = 1 * Q$$

(a) *15 points.* Please determine: ☐ the initial market equilibrium price and quantity in the absence of a policy; ☐ the efficient quantity; ☐ the efficient buyer and seller prices; ☐ the subsidy rate that would move the market to the efficient equilibrium; ☐ the resulting change in CS; ☐ the change in PS; ☐ the change in government revenue; ☐ the change in the benefits created by the externality; and ☐ the change in SS from the policy.

Part 4 (15 points)

A government agency serves two markets, U and R, and is subject to a cross-subsidy policy that requires it to charge the same $100 price in both markets even though its costs (WTA) are lower in U than R. Partial information about the two markets is given below. Finally, the agency is currently running at a loss: it is paying out $100,000 more in subsidies in R than it is collecting in surplus in U. The government is using money from its general revenue fund to make up the difference.

Variable	**U**	**R**
Initial Q	10,000	4,000
WTA	$80	see below
Demand elasticity	-1	-0.5

(a) *15 points*. Please determine: ☐ the agency's extra revenue in the U market; ☐ the value of WTA_R; ☐ the new quantity in each market if the cross-subsidy policy were eliminated and the agency charged each group the corresponding WTA (and thus no longer needed the additional $100,000); ☐ the change in CS in each market; ☐ the overall change in SS from eliminating the policy.

Additional page for calculations
If you use this, please remember to indicate near the question that part of the answer is here.