SUID:

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Exam 1
Fall 2023

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. You may write on the backs of pages, on the extra page at the end, or on extra sheets of paper but **BE SURE TO NOTE THAT NEAR THE QUESTION**.

5. If you use extra sheets of paper, please number them so you can do step 4 above.

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

Question 1 (30 points)

A good is purchased by households of types A and B and produced by sellers of type C. Key information about each group is shown below, where *count* is the number of individuals of that type:

Type	**Count**	**Curve**	**Income**
Individual type A buyer	80	$WTP_a = 220 - 4Q_{Ai}^D$	80,000
Individual type B buyer	20	$WTP_b = 140 - 2Q_{Bi}^D$	20,000
Individual type C seller	40	$WTA_c = 10 + 2Q_{Ci}^S$	NA

(a) *15 points.* Please compute: ☐ the market equilibrium price and quantity; ☐ the quantities purchased by an individual of each type (A and B); and ☐ illustrate the market equilibrium with an appropriate graph. (There is additional space on the next page.)

Additional space for Question 1.

Question 1, continued

Now suppose the government is considering a $50 subsidy on the good and would like to know how it would impact the market, whether buyers or sellers benefit the most, and whether it would be progressive or regressive. Note that a subsidy is regressive if high income households receive a larger amount of subsidy as a percent of their income than low income households.

(b) *15 points.* Please compute the following when the subsidy is in place: ☐ the new buyer and seller prices; ☐ the shares of the $50 received by buyers and sellers; ☐ the new market quantity; ☐ the new quantity purchased by an individual household of each buyer type (A and B); ☐ the amount of spending on the subsidy received by an individual household of each buyer type (A and B); and, finally, ☐ indicate whether the subsidy is progressive or regressive, including any necessary calculations.

Question 2 (15 points)

A common dispute in international trade is over a practice known as "dumping". Dumping occurs when exporting countries provide subsidies for their exports and thus sell them on world markets below their true cost. It's considered an unfair policy and importing countries often respond by imposing large tariffs on the dumped goods. In August, the US accused one of its trading partners of dumping tin-plated steel on the world market and imposed a tariff of more than 100% in response. This question examines a stylized version of the policy.

Suppose under BAU a particular good is produced by a domestic firm (H for home production) and a foreign firm (F). Initially, the price of the good is \$40 and 1000 units are being purchased by US consumers: 400 units from H and 600 units from F. The supply by H has an elasticity of 0.5 and the supply by F is perfectly elastic at $WTA_F = \$40$. Demand for the good has an elasticity of -0.2. The US government subsequently becomes aware that F is dumping and imposes a tariff of \$40 on imports.

15 points. Please determine the following: ☐ the new equilibrium price and total quantity consumed; ☐ the new quantities produced by H and F; ☐ the change in CS; ☐ the change in PS for each firm; ☐ the revenue produced by the tariff; and ☐ the overall change in SS. Finally, the goal of antidumping tariffs is to reduce demand for the dumped product. ☐ Briefly comment on successful the policy is at accomplishing that goal.

Question 3 (15 points)

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

$$WTP = 1600 - 2Q$$
$$WTA = 6Q$$
$$MC_e = 2Q$$

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 tax rate that would move the market to the efficient equilibrium; ☐ the change in government revenue; and ☐ the change externality costs caused by the policy.

Question 4 (15 points)

In 2022, Congress passed the CHIPS and Science Act, which provides billions of dollars of subsidies and other incentives for semiconductor (chip) manufacturing in the US. This question explores a stylized version of the policy. Suppose chips are manufactured by domestic (H for home production) and foreign (F) producers. The market demand curve and the supplies by H and F are given below where P_H^S and P_F^S are the seller prices for H and F producers:

$$Q_M^D = 1500 - 4P^d$$
$$Q_H^S = 2P_H^s$$
$$Q_F^S = 4P_F^S$$

Initially (BAU), there are no taxes or subsidies. Under the policy, the government would provide a $50 subsidy for domestic (H) production *only*: there would be *no* subsidy for foreign (F) production. Buyers regard the H and F products as identical: P^d is the same for both.

15 points. Please determine: ☐ the initial BAU equilibrium prices and values of Q_M^D, Q_H^S and Q_F^S. Then, ☐ determine the equilibrium buyer and seller prices under the subsidy policy, and ☐ the corresponding quantities. Finally, ☐ compute the change in PS for each seller (H and F) and comment on briefly on how the policy affects the two.

Extra credit: Compute the change in CS, overall spending on the subsidy by the government, and then comment on whether the policy helps or hurts the US overall (i.e., excluding impacts on F).

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