SUID:

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Exam 1
Fall 2022

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:

Type	**Number**	**Curve**	**Income**
Individual type A buyer	50	$WTP_{Ai} = 120 - 0.2Q_{Ai}^{D}$	100,000
Individual type B buyer	75	$WTP_{Bi} = 200 - 0.5Q_{Bi}^{D}$	40,000
Individual type C seller	80	$WTA_{Ci} = 20 + 0.05Q_{Ci}^{S}$	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 $30 tax on the good and would like to know how it would impact the market, and whether it would be progressive or regressive.

(b) *15 points.* Please compute the following when the tax is in place: ☐ the new buyer and seller prices; ☐ the share of the tax burden borne by buyers; ☐ the new market quantity; ☐ the new quantity purchased by an individual household of each buyer type (A and B); ☐ the amount of tax revenue paid by an individual household of each buyer type (A and B); and, finally, ☐ indicate whether the tax is progressive or regressive, including any necessary calculations.

Question 2 (15 points)

Suppose that a particular good is supplied by domestic firms and foreign firms. The market price of a good is currently $500. A total of 10,000 units are being consumed and the elasticity of demand is known to be −0.5. Domestic firms (H, for home) currently supply 4,000 units and have a supply elasticity of 2.5. Foreign firms (F) are supplying the remaining 6,000 units and are known to have a perfectly elastic supply curve with a WTA_F of $500.

The government has become concerned that foreign firms have lower labor costs that give them an unfair advantage relative to domestic firms. It is considering a new trade agreement that would require foreign suppliers to spend $100 more on labor for each unit of the good they sell to the US. You may assume that this raises WTA_F to $600, and that the extra $100 on each unit sold will end up as a transfer to foreign workers. There are no other trade policies in effect (no tariffs or quotas).

15 points. Please determine the following: ☐ the new market price after the agreement takes effect; ☐ the new total quantity consumed; ☐ the new quantities produced by H and F; ☐ the change in CS; ☐ the change in PS for H; ☐ the transfer received by foreign workers. Finally, ☐ briefly summarize in words who is helped and who is hurt by this policy.

Question 3 (15 points)

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

$$WTP = 700 - 4Q$$
$$WTA = 3Q$$
$$MB_e = 2Q$$

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

Question 4 (15 points)

The war in Ukraine has caused major disruptions of energy supplies to Europe. To reduce the impact on the public, European governments have considered a range of policies, including subsidizing energy. This question examines the possible impacts of that approach.

Suppose a good is produced by a domestic source (H) and a foreign source (F). The market demand and the supply by H are given below. The supply by F is perfectly elastic and its WTA is shown as well. Initially there are no taxes or subsidies and the market is in equilibrium.

$$Q_M^D = 1050 - 0.5P^d$$
$$Q_H^S = 750 + 0.5P^s$$
$$WTA_F = 100$$

(a) *7 points.* Please determine: ☐ the initial price and values of Q_M^D, Q_H^S and Q_F^S. Then suppose that a crisis occurs and there is no longer any supply by F. Please determine the ☐ new market equilibrium price and quantity; and ☐ the change in CS caused by the disruption.

Question 4, continued.

(b) *8 points.* Finally, suppose the government wants to help consumers by adopting a subsidy, S, that would reduce the price to buyers, P^d, back to its original, pre-crisis value. Please determine: ☐ the value of S that would be needed; ☐ the amount of revenue that would have to be spent on the subsidy; and ☐ the change in PS for the H producer relative to the original equilibrium before the crisis. Briefly ☐ discuss the size of the subsidy relative to the impact on consumers and producers.

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