STANDARD TRADE MODEL

1-4 Free trade prevails between Canada and the ROW. Suppose Canada experiences economic growth, while the ROW has no growth. Canada’s growth is biased toward furniture.

1. In world markets, the relative supply of furniture to rugs:
   a) rises
   b) falls
   c) stays the same
   d) rises, if Canada exports furniture and imports rugs
   e) falls, if Canada exports furniture and imports rugs

2. In world markets, the relative price of furniture to rugs:
   a) rises
   b) falls
   c) stays the same
   d) rises, if Canada exports furniture and imports rugs
   e) falls, if Canada exports furniture and imports rugs

3. The secondary effect of the economic growth on Canada is a terms of trade:
   a) improvement
   b) deterioration
   c) unchanged
   d) improvement, if Canada exports furniture and imports rugs
   e) deterioration, if Canada exports furniture and imports rugs

4. The secondary effect of Canada’s growth on the ROW is a terms of trade:
   a) improvement
   b) deterioration
   c) unchanged
   d) improvement, if Canada exports furniture and imports rugs
   e) deterioration, if Canada exports furniture and imports rugs
FOREIGN DIRECT INVESTMENT

5-8 A firm is deciding how to serve the market in India.

5. A US firm building a new production facility in India is called
   a) merger & acquisition
   b) brownfield FDI
   c) greenfield FDI
   d) joint venture
   e) licensing

6. When only parts of the production processes are transferred to the affiliate location in India, it is called
   a) horizontal FDI
   b) vertical FDI
   c) export platform FDI
   d) proximity FDI
   e) tariff-jumping FDI

7. Horizontal FDI is driven mainly by a desire to locate production
   a) close to large customer bases
   b) to minimize production costs
   c) in as few concentrated locations as possible
   d) according to comparative advantage
   e) in host countries similar to the source country

8. Most foreign direct investment occurs from _______ source countries into _______ host countries.
   a) developed, developed
   b) developed, developing
   c) developing, developed
   d) developing, developing
   e) no clear pattern
TRADE POLICIES

9-12 Suppose the United States adopts a binding quota on imports of sugar.

9. The quantity demanded of sugar and consumer surplus in the United States
   a) rises due to the US price of sugar rising
   b) rises due to the US price of sugar falling
   c) remains the same
   d) falls due to the US price of sugar rising
   e) falls due to the US price of sugar falling

10. The quantity supplied of sugar and producer surplus in the United States
    a) rises due to the US price of sugar rising
    b) rises due to the US price of sugar falling
    c) remains the same
    d) falls due to the US price of sugar rising
    e) falls due to the US price of sugar falling

11. United States welfare is harmed by the quota due to:
    a) consumption distortion because too little sugar consumed
    b) production distortion because too much sugar produced
    c) quota rents transferred to foreign sugar producers
    d) a, b and c
    e) a and b

12. World welfare is harmed by the quota due to:
    a) consumption distortions because too much sugar consumed elsewhere and too little consumed in the United States
    b) production distortions because too much sugar produced in the United States and too little produced elsewhere
    c) quota rents transferred to foreign sugar producers
    d) a, b and c
    e) a and b
13-16 Suppose Switzerland adopts an export subsidy on dairy products. Switzerland is large enough to affect world prices for dairy products.

13. The price of dairy products in Switzerland will _____ due to adopting the export subsidy.
   a) rise by the full amount of the subsidy
   b) rise by less than the full amount of the subsidy
   c) fall by the full amount of the subsidy
   d) fall by less than the full amount of the subsidy
   e) remain unchanged

14. The price of dairy products in the rest of the world will _____ due to Switzerland adopting an export subsidy.
   a) rise by the full amount of the subsidy
   b) rise by less than the full amount of the subsidy
   c) fall by the full amount of the subsidy
   d) fall by less than the full amount of the subsidy
   e) remain unchanged

15. Switzerland welfare is harmed by the export subsidy due to:
   a) consumption distortion because too little dairy consumed
   b) production distortion because too much dairy produced
   c) terms of trade loss due to making dairy exports cheaper
   d) a, b and c
   e) a and b

16. World welfare is harmed by the export subsidy due to:
   a) consumption distortions because too much dairy consumed elsewhere and too little consumed in Switzerland
   b) production distortions because too much dairy produced in Switzerland and too little produced elsewhere
   c) terms of trade loss due to making dairy exports cheaper
   d) a, b and c
   e) a and b
TRADE POLICY PROBLEMS

In the United States (US), inverse demand is \( P = 48 - 2Q_D \), while inverse supply is \( P = 8 + 2Q_S \). In the rest of the world (ROW), inverse demand is \( P^* = 22 - 2Q_D^* \), while inverse supply is \( P^* = 2 + 2Q_S^* \).

1. Derive the US autarky price and quantity.

Derive the US import demand (including slope-intercept form).

Derive the ROW autarky price and quantity.

Derive the ROW export supply (including slope-intercept form).
2. Derive the free trade price and US imports under free trade.

Derive US quantity demanded and quantity supplied under free trade.

3. Derive the US tariff-ridden import demand for a specific tariff $t = 8$ (including slope-intercept form).

Derive the ROW price, the US price, and US imports with the tariff.

Derive US quantity demanded and quantity supplied with the tariff.

How large of a tariff would the United States need to impose to prohibit all imports?
4. Derive the change in consumer surplus, producer surplus, and government revenue in the United States due to the tariff (starting with the general equations and being sure to indicate the areas corresponding to each on the US graph).

5. Define and derive the US consumption distortion and production distortion.

Define and derive the US efficiency loss and terms of trade gain.

6. Derive the change in welfare in the United States due to the tariff. Confirm that the net welfare calculation yields the same answer.

Is the United States better or worse off with the tariff and why?
DRAW WORLD MARKET GRAPH HERE: US IMPORT DEMAND, ROW EXPORT SUPPLY, US TARIFF-RIDDEN IMPORT DEMAND

DRAW US MARKET GRAPH HERE: US DEMAND, US SUPPLY
Indicate free trade price, US quantity demanded and quantity supplied under free trade, US tariff-ridden price, US quantity demanded and quantity supplied with the tariff, and ROW tariff-ridden price. Label areas corresponding to change in consumer surplus, change in producer surplus, change in government revenue, production distortion, consumption distortion, efficiency loss, and terms of trade gain.

On my honor as an Aggie, I have neither given nor received unauthorized aid on this exam.

Signature __________________________
MULTIPLE CHOICE

1a In world markets, the relative supply of furniture to rugs rises.
2b In world markets, the relative price of furniture to rugs falls.
3e The secondary effect of the economic growth on Canada is a terms of trade deterioration, if Canada exports furniture and imports rugs.
4d The secondary effect of Canada’s growth on the ROW is a terms of trade improvement, if Canada exports furniture and imports rugs.
5c A US firm building a new production facility in India is called greenfield FDI.
6b When only parts of the production processes are transferred to the affiliate location in India, it is called vertical FDI.
7a Horizontal FDI is driven mainly by a desire to locate production close to large customer bases.
8a Most foreign direct investment occurs from developed source countries into developed host countries.
9d The quantity demanded of sugar and consumer surplus in the United States falls due to the US price of sugar rising.
10a The quantity supplied of sugar and producer surplus in the United States rises due to the US price of sugar rising.
11d United States welfare is harmed due to consumption and production distortions, and quota rents transferred to foreign sugar producers.
12e World welfare is harmed due to consumption and production distortions.
13b The price of dairy products in Switzerland will rise by less than the full amount of the subsidy due to adopting the export subsidy.
14d The price of dairy products in the rest of the world will fall by less than the full amount of the subsidy.
15d Switzerland welfare is harmed by the export subsidy due to consumption and production distortion because too much dairy produced, and terms of trade loss due to making dairy exports cheaper.
16e World welfare is harmed by the export subsidy due to consumption and production distortions.
TRADE POLICY PROBLEMS

1. Derive US autarky price and quantity.
   \[ 48 - 2 Q^A = 8 + 2 Q^A, \quad 4 Q^A = 40, \quad Q^A = 10 \]
   \[ P^A = 48 - 2 Q^A = 48 - 20 = 28 \]

   Derive the US import demand (including slope-intercept form).
   \[ P = 48 - 2 Q_D, \quad Q_D = 24 - \frac{1}{2}P \]
   \[ P = 8 + 2 Q_S, \quad Q_S = -4 + \frac{1}{2}P \]
   \[ M = Q_D - Q_S = 24 - \frac{1}{2}P - \left( -4 + \frac{1}{2}P \right) \]
   \[ M = 28 - P, \quad P = 28 - Q_M \]

   Derive the ROW autarky price and quantity.
   \[ 22 - 2 Q^{A*} = 2 + 2 Q^{A*}, \quad 4 Q^{A*} = 20, \quad Q^{A*} = 5 \]
   \[ P^{A*} = 22 - 2 Q^{A*} = 22 - 10 = 12 \]

   Derive the ROW export supply (including slope-intercept form).
   \[ P^* = 2 + 2 Q^*_S, \quad Q^*_S = -1 + \frac{1}{2}P^* \]
   \[ P^* = 22 - 2 Q^*_D, \quad Q^*_D = 11 - \frac{1}{2}P^* \]
   \[ X^* = Q^*_S - Q^*_D = -1 + \frac{1}{2}P^* - \left( 11 - \frac{1}{2}P^* \right) \]
   \[ X^* = -12 + P^*, \quad P^* = 12 + Q^*_X \]
2. Derive the free trade price and US imports under free trade.
\[ M = X^*, \; 28 - P = -12 + P^*, \; 40 = 2P, \; P = P^* = 20 \]
\[ M = 28 - P = 28 - 20 = 8 \]
Derive US quantity demanded and quantity supplied under free trade.
\[ P = 48 - 2Q_D, \; 20 = 48 - 2Q_D, \; D^1 = Q_D = 14 \]
\[ P = 8 + 2Q_S, \; 20 = 8 + 2Q_S, \; S^1 = Q_S = 6 \]

3. Derive the US tariff-ridden import demand for a specific tariff \( t = 8 \) (including slope-intercept form).
\[ M_T = 28 - P_T = 28 - (P_T^* + 8), \; M_T = 20 - P_T^*, \; P_T^* = 20 - Q_{M_T} \]
Derive the ROW price, the US price, and US imports with the tariff.
\[ M_T = X^*, \; 20 - P_T^* = -12 + P_T^*, \; 32 = 2P_T^*, \; P_T^* = 16 \]
\[ P_T = P_T^* + t = 16 + 8 = 24 \]
\[ M_T = 20 - P_T^* = 20 - 16 = 4 \]
Derive US quantity demanded and quantity supplied with the tariff.
\[ P^T = 48 - 2Q_D^T, \; 24 = 48 - 2Q_D^T, \; D^2 = Q_D^T = 12 \]
\[ P^T = 8 + 2Q_S^T, \; 24 = 8 + 2Q_S^T, \; S^2 = Q_S^T = 8 \]
How large of a tariff would the United States need to impose to prohibit all imports?
\[ t' = P^A - P^{A*} = 28 - 12 = 16 \]
4. Derive the change in consumer surplus, producer surplus, and government revenue in the United States due to the tariff.

\[ \Delta CS = -abcd = -(P_T - P) \left( \frac{D^1 + D^2}{2} \right) = -(24 - 20) \left( \frac{14 + 12}{2} \right) = -52 \]

\[ \Delta PS = \alpha = (P_T - P) \left( \frac{S^1 + S^2}{2} \right) = (24 - 20) \left( \frac{6 + 8}{2} \right) = 28 \]

\[ \Delta GR = \epsilon e = tM_T = 8(4) = 32 \]

5. Define and derive the US consumption distortion and production distortion.

*Consumption distortion is loss due to too little consumption.*

\[ d = \Delta P \left( \frac{\Delta D}{2} \right) = (24 - 20) \left( \frac{12 - 12}{2} \right) = 4 \]

*Production distortion is loss due to too much production.*

\[ b = \Delta P \left( \frac{\Delta S}{2} \right) = (24 - 20) \left( \frac{8 - 6}{2} \right) = 4 \]

Define and derive the US efficiency loss and terms of trade gain.

*Efficiency loss is size of total distortion, consumption plus production.*

\[ b + d = 4 + 4 = 8 \]

*Terms of trade gain is degree that buy imports cheaper.*

\[ \epsilon = (P - P^*)M_T = (20 - 16)(4) = 16 \]

6. Derive the change in welfare in the United States due to the tariff. Confirm that the net welfare calculation yields the same answer.

\[ \Delta W = \Delta CS + \Delta PS + \Delta GR = -52 + 28 + 32 = 8 \]

\[ e - (b + d) = 16 - 8 = 8 \]

Is the United States better or worse off due to the tariff and why?

Better. *The terms of trade gain outweighs the efficiency loss for large country adopting a small tariff starting from free trade.*

US MARKET GRAPH: US DEMAND, US SUPPLY