FOREIGN DIRECT INVESTMENT

1-4 A Japanese firm is deciding how to serve the U.S. market for SUVs.

1. Desire to avoid tariffs on U.S. imports of luxury SUVs would be
   a) an ownership advantage
   b) a location advantage
   c) an internalization advantage
   d) an international advantage
   e) none of the above

2. Lower production costs in the United States than Japan would be
   a) an ownership advantage
   b) a location advantage
   c) an internalization advantage
   d) an international advantage
   e) none of the above

3. That for the same cost of production, the Japanese firm knows how to produce a higher quality SUV than U.S. firms do would be
   a) an ownership advantage
   b) a location advantage
   c) an internalization advantage
   d) an international advantage
   e) none of the above

4. If the Japanese firm has an ownership advantage and a location advantage but not sure if there is an internalization advantage, which ways of serving the U.S. market remain as possible choices?
   a) Let U.S. firms sell SUVs in the U.S. market.
   b) Produce in Japan and export the SUVs to the United States.
   c) Sign a contract with a U.S. firm licensing them to make SUVs
   d) Build or buy a plant in the United States run by a subsidiary
   e) c) or d)
INTERPTEMPORAL TRADE

5-8 When face the same interest rate, the United States consumes more currently relative to the future compared to the ROW, and the United States produces less currently relative to the future than the ROW.

5. In September 2010, the United States ran a trade deficit in goods and services of $44 billion. In what sense must intertemporal trade be balanced? A country
   a) cannot import more cloth than the value of its food exports.
   b) must consume less than produce in the future if currently consume less than produce in value
   c) can consume more than produce in the future if currently consume more than produce in value
   d) cannot borrow more than will be able to repay later
   e) all of the above except a)

6. In an intertemporal budget constraint, the relative price of current to future, \( P_C / P_F \), is
   a) the interest rate \( r \)
   b) \( 1 + \frac{1}{r} \)
   c) \( 1 / r \)
   d) \( 1 / (1 + r) \)
   e) equal to the relative price of cloth to food

7. The pattern of intertemporal trade will be that the
   a) United States borrows from the ROW
   b) ROW borrows from the United States
   c) United States lends to the ROW
   d) ROW lends to the United States
   e) a) and d)

8. Who gains from intertemporal trade?
   a) The ROW
   b) The United States
   c) Both the United States and the ROW
   d) Neither the United States nor the ROW
   e) Only lenders in the United States and borrowers in the ROW
TRADE POLICIES

9-12 The United States imposes a binding quota on imports of textiles from China.

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

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

11. The quota causes U.S. welfare to fall due to
    a) consumption distortions
    b) production distortions
    c) quota rents being transferred to Chinese textile producers
    d) all of the above
    e) a) and b)

12. Compared to the quota, what would change if the United States replaced the quota with a tariff that was chosen to yield the exact same price of textiles in each country and exact same volume of imports as did the quota?
    a) U.S. textile consumers would be hurt more by the tariff
    b) U.S. textile consumers would be hurt less by the tariff
    c) U.S. textile producers would gain more from the tariff
    d) U.S. textile producers would gain less from the tariff
    e) U.S. government would collect tariff revenue, making U.S. welfare better with a tariff than it was with the quota
13-16 The United States, a large country, removes a specific subsidy on agricultural exports.

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

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

15. The export subsidy causes U.S. welfare to fall due to
   a) consumption distortions
   b) production distortions
   c) terms of trade loss due to allowing the ROW to buy U.S. agricultural exports cheaper
   d) all of the above
   e) a) and b)

16. Compared to the export subsidy, what would change if the United States replaced the export subsidy with a lump sum transfer to agricultural producers that gave them the exact same producer surplus as they had with the export subsidy?
   a) consumption distortion would be eliminated
   b) production distortion would be eliminated
   c) consumer surplus would not fall so consumers would benefit
   d) consumer surplus would not rise so consumers would be hurt
   e) all of the above except d)
TRADE POLICY PROBLEMS

In the United States (US), inverse demand is \( P = 74 - 2Q_D \), while inverse supply is \( P = 38 + 2Q_S \). In the rest of the world (ROW), inverse demand is \( P^* = 52 - 2Q_D^* \), while inverse supply is \( P^* = 12 + 2Q_S^* \).

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 $t = 12$ (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

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

Signature __________________________
1b Avoiding tariffs on U.S. imports of luxury SUVs would be a **location advantage**.
2b Lower production costs in the United States would also be a **location advantage**.
3a The Japanese firm knowing how to produce a higher quality SUV would be an **ownership advantage**.
4e Signing a contract with a U.S. firm licensing them to make SUVs or building or buying a plant run by a U.S. subsidiary remain possible.
5d A country cannot borrow more than will be able to repay later.
6b The relative price of current to future, \( \frac{P_c}{P_f} \), is \( 1 + r \).
7e The pattern of intertemporal trade will be that the United States borrows from the ROW and the ROW lends to the United States.
8c Both the United States and the ROW gain from intertemporal trade.
9d The U.S. quantity demanded of textiles and consumer surplus in falls due to the US price of textiles rising.
10a The U.S. quantity supplied of textiles and producer surplus rises due to the US price of textiles rising.
11d The quota causes U.S. welfare to fall due to consumption distortions, production distortions, and quota rents being transferred abroad.
12e If the United States replaced the quota with a tariff, then the U.S. government would collect tariff revenue, making U.S. welfare better with a tariff than it was with the quota.
13b The U.S. quantity demanded of agricultural products and consumer surplus rises due to the US price of agricultural products falling.
14e The U.S. quantity supplied of agricultural products and producer surplus falls due to the US price of agricultural products falling.
15d The export subsidy causes U.S. welfare to fall due to consumption distortions, production distortions, and a terms of trade loss due to allowing the ROW to buy U.S. agricultural exports cheaper.
16e If replaced the export subsidy with a lump sum transfer to agricultural producers, the consumption and production distortions would be eliminated and consumer surplus would not fall so consumers would benefit.
PROBLEMS

1. Derive US autarky price and quantity.
   \[ 74 - 2 Q^A = 38 + 2 Q^A, \quad 4 Q^A = 36, \quad Q^A = 9 \]
   \[ P^A = 74 - 2 Q^A = 74 - 18 = 56 \]

   Derive the US import demand (including slope-intercept form).
   \[ P = 74 - 2 Q_D, \quad Q_D = 37 - \frac{1}{2} P \]
   \[ P = 38 + 2 Q_S, \quad Q_S = -19 + \frac{1}{2} P \]
   \[ M = Q_D - Q_S = 37 - \frac{1}{2} P - \left( -19 + \frac{1}{2} P \right) \]
   \[ M = 56 - P, \quad P = 56 - Q_M \]

   Derive the ROW autarky price and quantity.
   \[ 52 - 2 Q^{A*} = 12 + 2 Q^{A*}, \quad 4 Q^{A*} = 40, \quad Q^{A*} = 10 \]
   \[ P^{A*} = 52 - 2 Q^{A*} = 52 - 20 = 32 \]

   Derive the ROW export supply (including slope-intercept form).
   \[ P^* = 12 + 2 Q_S^*, \quad Q_S^* = -6 + \frac{1}{2} P^* \]
   \[ P^* = 52 - 2 Q_D^*, \quad Q_D^* = 26 - \frac{1}{2} P^* \]
   \[ X^* = Q_S^* - Q_D^* = -6 + \frac{1}{2} P^* - \left( 26 - \frac{1}{2} P^* \right) \]
   \[ X^* = -32 + P^*, \quad P^* = 32 + Q_X^* \]
2. Derive the free trade price and US imports under free trade.

\[ M = X^*, \ 56 - P = -32 + P^*, \ 88 = 2P, \ P = P^* = 44 \]

\[ M = 56 - P = 56 - 44 = 12 \]

Derive US quantity demanded and quantity supplied under free trade.

\[ P = 74 - 2Q_D, \ 44 = 74 - 2Q_D, \ D^1 = Q_D = 15 \]

\[ P = 38 + 2Q_S, \ 44 = 38 + 2Q_S, \ S^1 = Q_S = 3 \]

3. Derive the US tariff-ridden import demand for a specific tariff \( t = 12 \) (including slope-intercept form).

\[ \begin{align*} 
M_T &= 56 - P_T = 56 - (P_T^* + 12) \\
M_T &= 44 - P_T^* \\
P_T &= P_T^* + t = 38 + 12 = 50 \\
M_T &= 44 - P_T^* = 44 - 38 = 6 
\end{align*} \]

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

\[ M_T = X^*, \ 44 - P_T^* = -32 + P_T^*, \ 76 = 2P_T^*, \ P_T^* = 38 \]

\[ P_T = P_T^* + t = 38 + 12 = 50 \]

\[ M_T = 44 - P_T^* = 44 - 38 = 6 \]

Derive US quantity demanded and quantity supplied with the tariff.

\[ \begin{align*} 
P_T &= 74 - 2Q_D^T, \ 50 = 74 - 2Q_D^T, \ D^2 = Q_D^T = 12 \\
P_T &= 38 + 2Q_S^T, \ 50 = 38 + 2Q_S^T, \ S^2 = Q_S^T = 6 
\end{align*} \]

How large of a tariff would the United States need to impose to prohibit all imports?

\[ t' = P^A - P_A^* = 56 - 32 = 24 \]
4. Derive the change in consumer surplus, producer surplus, and government revenue in the United States due to the tariff.

\[ \Delta CS = -abcd = -(P_T - P) \left( \frac{D^1 + D^2}{2} \right) = -(50 - 44) \left( \frac{15 + 12}{2} \right) = -81 \]

\[ \Delta PS = a = (P_T - P) \left( \frac{S^1 + S^2}{2} \right) = (50 - 44) \left( \frac{3 + 6}{2} \right) = 27 \]

\[ \Delta GR = ce = tM_T = 12(6) = 72 \]

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

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

\[ d = \Delta P \left( \frac{\Delta D}{2} \right) = (50 - 44) \left( \frac{15 - 12}{2} \right) = 9 \]

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

\[ b = \Delta P \left( \frac{\Delta S}{2} \right) = (50 - 44) \left( \frac{6 - 3}{2} \right) = 9 \]

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

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

\[ b + d = 9 + 9 = 18 \]

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

\[ e = (P - P^*)M_T = (44 - 38)(6) = 36 \]

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

\[ \Delta W = \Delta CS + \Delta PS + \Delta GR = -81 + 27 + 72 = 18 \]

\[ e-(b+d) = 36 - 18 = 18 \]

Is the United States is 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