

**Part I: Short Answer Questions:** To answer these questions you must identify (i.e. define) the listed concept and give its significance *to this course*. Fully correct answers do only this (Do not try to prove or derive anything or discuss the concept in detail). The answers to these questions can be given in four sentences or less. You will lose points for writing material unrelated to the answer so *think before writing*. **Credit: Answer 8 (eight) of the following for 5 points each** (40 total points).

1. *Statutory tariff of the United States*: This lists the rates of duty paid by trading partners not receiving MFN treatment or special treatment. Based on the Smoot-Hawley tariff of 1930. Only a small number of trading partners pay this rate, but this illustrates the importance of MFN treatment.

2. *Multi-fibre Arrangement*: The MFA is a global cartel, in place since 1963, regulating trade in textiles and apparel via the use of voluntary export restraints negotiated between the major importing nations and the major exporting nations. Thus, the US has bilateral VERs on virtually all textile and apparel imports with all of its major suppliers. The MFA is due to be phased out, by 2005, under the Uruguay round GATT.

3. *Optimal tariff*: The optimal tariff is the tariff that maximizes national welfare. For the small economy it is zero, but any large economy has a strictly positive optimal tariff. It is the basis of a first-best argument for protection.

4. *Economic argument for protection*: Economic arguments for protection identify a *distortion* which, under conditions of free trade, causes the equilibrium to diverge from the welfare optimum. Thus, some intervention can, at least in principle, raise national welfare. In this course, we have been concerned with the possible role of trade policy as an instrument for making such a response.

5. *Dumping*: Under US trade law, dumping is defined as “sales at less than fair market value” and implemented as sales in the US at a price lower than that of the equivalent product sold: 1) in the home market of the exporter; 2) in an equivalent third market; or 3) constructed value. A product dumped in the US market is subject to a duty (in the amount of the dumping margin), if it can be demonstrated that a US industry is injured by the dumping.

6. *Reciprocal Trade Agreements Act of 1934*: The act that formed the statutory basis for contemporary trade policy. Contained two major components: authority for the Executive to negotiate reciprocal trade agreements under generalized MFN; and created the ground rules under which administered protection operated.

7. *Voluntary export restraint*: A form of quantitative restriction in which the exporting country manages the restraint, and thus collects (or at least allocates) the quota rents. Because the rents are transferred abroad, the costs of a VER are higher than the costs of an equivalent quota whose rents are distributed to Home citizens.

8. *Metzler paradox*: Faced with a backward bending Foreign export supply curve, the price reduction induced by the tariff results in an increase in the volume of imports and a paradoxical fall in the domestic price. Thus, the importable good is actually damaged by protection. In addition, the abundant factor is protected via Stolper-Samuelson logic. An important complexity in the analysis of the sectoral and income distributional effects of trade policy.

9. *ad valorem* tariff: A tariff applied to the value (i.e. price of the imported commodity). Thus, the effect on home price is determined as  $P = P^* (1 + t)$ . This is currently the most common form of tariff.

10. *Learning curve*: Some industries are characterized by the condition that, as a result of learning by workers and supervisors, unit costs of production decline with every additional *cumulative* unit produced. If graphed, this is a learning curve. Industries characterized by learning may benefit from trade intervention. In fact, because the tariff encourages output and, unlike a subsidy, decreases foreign output, learning forms the basis of a first-best economic argument for protection.

11. *Conservative social welfare function*: Reflects the idea that industrial societies have a commitment not to allow any significant part of the population experience a significant decline in income. Forms the basis of a first-best, non-economic argument for protection.

12. *Value added*: The value of a firm's (or sector's) output less the value of inputs it purchases from other firms. Because protection on inputs affects value-added, in evaluating the effect of protection on the firm it is necessary to use the *effective rate of protection*, which is a measure of the protection to value-added from the tariff schedule as a whole.

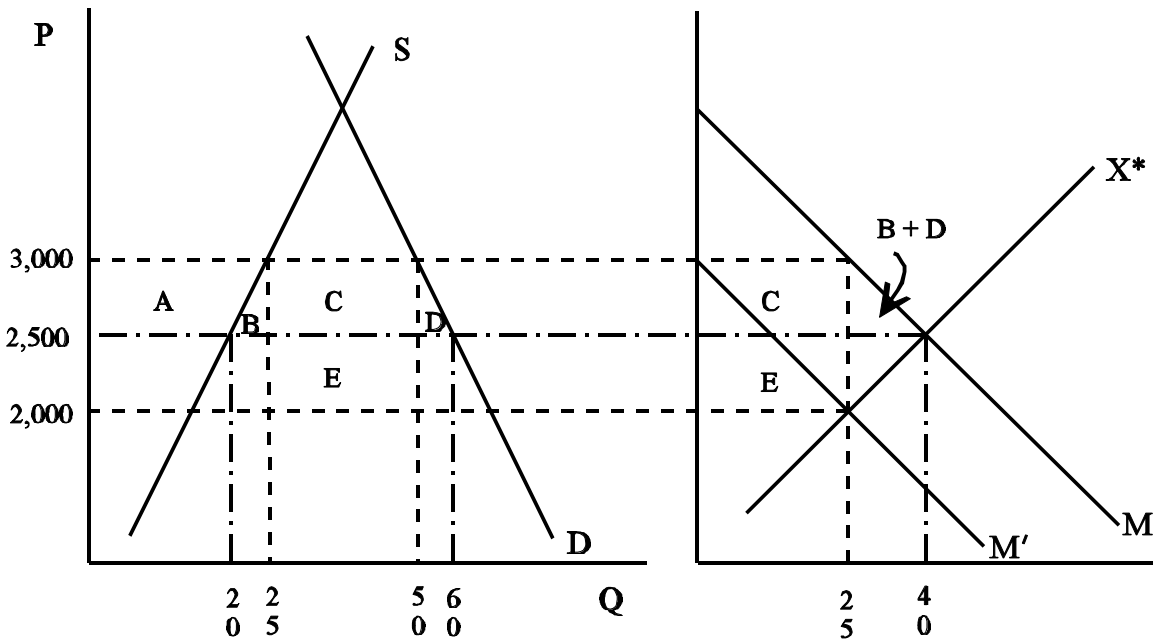
**Part II: Essays.** Answer **three (3)** for a total of 60 points. Your answers must be logical, complete and grammatical (i.e., you must write in complete, well-constructed sentences and paragraphs). If you use graphical or algebraic analysis to support your argument, you must explain fully the elements of your formalism. Think before writing.

1. Consider the following table:

	With \$1000 Tariff	Without \$1000 Tariff
World Price of a motorcycle	\$2,000	\$2,500
Tariff per unit	\$1,000	\$0
Price of a motorcycle in the US	\$3,000	\$2,500
Motorcycles bought in US per year	50,000	60,000
Motorcycles made in the US per year	25,000	20,000
Motorcycles imported into the US per year	25,000	40,000

You may assume that demand and supply curves are linear and that transportation costs are zero. Using the above information, and the appropriate graphical framework, answer the following questions:

First, set up the framework:



As indicated by the data presented above, this is a large-country, partial equilibrium analysis. A diagram of the sort presented above gives a framework within which this question can be answered. The free trade equilibrium, identified by point  $\alpha$  in the international market diagram, picks out the equilibrium price (\$2,500) and quantity traded (40,000 units) under free trade. In the home market, total sales are 60,000 units, of which 20,000 are supplied by domestic firms. The \$1,000 tariff shifts the import-demand curve

inward to  $M'$  (since the tariff leads to reduced demand and increased supply at any given world price, the excess demand at that price falls). In the new (post-tariff) equilibrium, the US market demands 25,000 foreign units and the world price falls to \$2,000 per unit (as a result of reduced demand). With the tariff, the US price of motorcycles rises to \$3,000. Total demand falls to 50,000 units, while domestic supply rises to 25,000 units.

a. Estimate the loss to domestic consumers' surplus from imposition of the tariff. [5 points]

The loss to consumers' surplus is given by  $-(A + B + C + D) = -[500(50,000) + \frac{1}{2} 500 \times 10,000] = -\$27,500,000$ .

b. Estimate the gain to domestic motorcycle producers from imposition of the tariff. [5 points]

The gain to producers is given by area A: \$11,250,000.

c. Estimate the revenue gain to the domestic government from imposition of the tariff. [5 points]

The revenue gain is given by areas C + E: \$25,000,000.

d. Estimate the net welfare effect of the tariff from imposition of the tariff. [5 points]

The net welfare effect of this tariff is given by the gain (E), less the deadweight losses (B + D):  $12,500,000 - 1,250,000 - 2,500,000 = 8,750,000$ .

2. Suppose that you are the managing director of the Amalgamated Widget Corporation. To produce one widget you need 2 gidgets and 5 ridgits. The world price of widgets is currently \$500, gidgets cost \$100, and ridgits cost \$10. You read in the newspaper that one candidate for Congress is proposing a 10% tariff on widgets and zero tariff on gidgets and ridgits, while the other candidate is proposing a 20% tariff on gidgets, a 30% tariff on ridgits and a 20% tariff on widgets. The chairman of the executive board tells you to make a large (secret) cash donation to the second candidate because he is promising more protection. Explain why the chairman of the executive board is wrong. Note--to answer this question correctly, you must: 1) Develop a framework within which you can provide a correct analysis of the two protection proposals and their effect on your firm [15 points]; and 2) explain the mistake being made by the chairman of the executive board [5 points].

Given the data in the question, and assuming fixed input-output coefficients, value added in widgets is:

$$\begin{aligned}
v_w &= p_w - a_{gw}p_g - a_{rw}p_r \\
&= 500 - 2(100) - 5(10) = 500 - 200 - 50 = \$250.
\end{aligned}$$

For comparison purposes, consider the value-added in widgets under politician 1's proposal (10,0,0) and under politician 2's proposal (20,20,30):

$$\begin{aligned}
v_w^c &= p_w(1 + t_w) - a_{gw}p_g(1 + t_g) - a_{rw}p_r(1 + t_r) \\
v_w^1 &= 500(1 + .1) - 2[100] - 5[10] = 550 - 200 - 50 = \$300, \\
v_w^2 &= 500(1 + .2) - 2[100(1 + .2)] - 5[10(1 + .3)] = 600 - 240 - 65 = \$295.
\end{aligned}$$

Thus, even though protection on widgets is higher under politician 2's proposal, the final effect of the proposal as a whole is lower than politician 1's proposal. The mistake was not taking account of the effect of protection on intermediates, which lowers own value-added by increasing the post-tariff price of those intermediates.

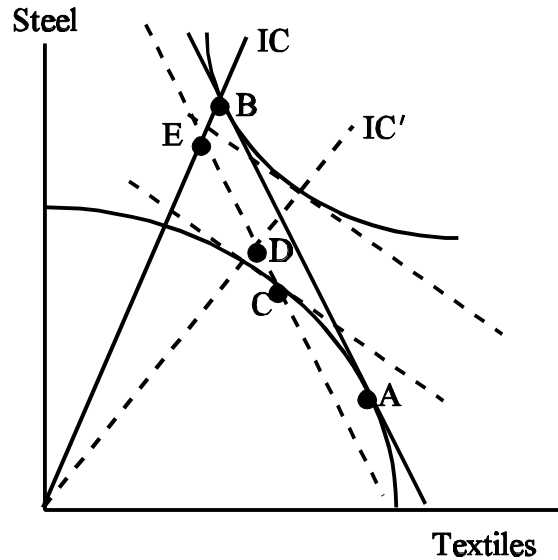
An alternative approach would be to compare effective rates of protection to widgets under the two schemes:

$$\begin{aligned}
e_w &= \frac{v_w^c - v_w}{v_w} = t_w + (t_w - t_g) \frac{a_{gw}p_g}{v_w} + (t_w - t_r) \frac{a_{rw}p_r}{v_w} \\
e_w^1 &= \frac{300 - 250}{250} = .1 + (.1) \frac{200}{250} + (.1) \frac{50}{250} = .2 \\
e_w^2 &= \frac{295 - 250}{250} = .2 + (.2 - .2) \frac{200}{250} + (.2 - .3) \frac{50}{250} = .18
\end{aligned}$$

In this case it is, again, easy to see that the widget industry receives more effective protection under the protectionist programme of politician 1 than that of politician 2.

3. Consider the case of an economically small economy, producing two goods (steel and textiles), with two factors of production (capital and labor), under constant returns to scale. Suppose at world prices that this country exports textiles and imports steel. Finally, assume (for simplicity) that tastes can be represented by a family of homothetic indifference curves. For reasons that need not concern us, the government decides that home production of steel should be increased.

a. Show that a tariff can accomplish this goal. (5 points)



With reference to the above diagram, it is clear that a tariff can induce a shift in production from A to C (this involves an increase in steel production and a decrease in the production of textiles). This occurs because the tariff raises the price of steel in the Home market by  $P_S = P_S^*(1 + t)$ ; thus, if  $p = P_T / P_S$ ,  $p^F$  is the relative price under free trade,  $p^T$  is the relative price under the tariff, and the tariff is strictly positive, it must be the case that  $p^T > p^F$ , and the arbitrage argument establishes the result.

b. Illustrate and explain the welfare losses caused by imposing the tariff. (5 points)

Because prices are fixed, national income at world prices can be evaluated in terms of the national income line (parallel to the free trade line, AB, but passing through the new production point, C). The difference between these two lines is the loss in national income as a result of the tariff. If preferences are homothetic, the difference between the welfare level shown by indifference curve through B and that through C gives the production effect of the tariff. In addition, because consumers also face the tariff, they cannot consume at E, but must consume at D (where  $MRS = MRT = p^T$  and income = expenditure).

c. Using the information from the first two parts of this question, explain why economists would not consider a tariff the first-best policy to accomplish this goal and what the first-best intervention would be. (10 points)

Using the logic of the theory of economic policy, since a production subsidy achieves the goal of increased steel output, but does not distort consumer choice (i.e. it's welfare cost is lower—Consumption and E yields higher welfare than consumption at D), such a tax-cum-subsidy scheme welfare dominates the tariff.

4. Imagine that you are an official in the Trade Ministry of an economically small country and you are visited by a delegation from the General Association of Gidget Manufacturers and Exchangers (GAGME). Their lawyer tells a very sad story. It seems, according to the lawyer, that Home country gidgets could be globally competitive if Home manufacturers of gidgets would make some investments in new technology that raises their competitiveness. However, the lawyer continues, Home gidget manufacturers are not currently willing to make such investments because international competition during the early stages of the investment will cause them to make losses and go out of business. He, the lawyer, suggests that it would be in the national interest to provide a reasonably short period of protection to this industry to encourage the adoption of the improved technology. Since you are a well-trained international economist, you tell him that you will need several pieces of information before you are willing to commit the government to such a policy. What pieces of information do you need? [Note: A complete answer to this question requires that you explain why each piece of information is essential to your final decision] (20 points)

The four pieces of information that underwrite a claim of this sort are:

1. That this industry is such that its establishment would generate a flow of future benefits large enough, in present value terms, to offset the present costs required to insure the successful establishment (including the costs associated with governmental policy actions);
2. That normal operation of the market will not support the establishment of the industry;
3. That some form of intervention *for a limited period of time* will create the conditions necessary for the industry's establishment; and
4. That (a limited period of) tariff protection is the optimal policy instrument.

The (positive NPV) link is necessary to the argument since without it proponents would be asking government to provide support for a project whose costs outweigh its benefits. This might be good for the industry, but we expect government support to be related to the general good of society. At any point in time, there may be a great many positive NPV projects. It will, however, usually be the case that (since this implies a positive rate of return) the private sector will respond to such opportunities. It is this that makes the second causal link the crucial link in the infant industry argument. There are a variety of possible ways of establishing the second link in the argument (non-response by market): the industry generates dynamic technological externalities that cannot be

**appropriated** (captured) by the investing firm; alternatively, there may be no externalities, but the capital market may be biased against investments of the size and/or complexity implied by the infant industry. It is the third link that gives the argument its name: the protection is of limited duration because the infant is supposed to grow up. We should now be familiar enough with the Bhagwati-Johnson theory to recognize that the fourth link is unsustainable. While a tariff may well be able to restore equality between MRT and FRT, it has the effect of driving a wedge between MRS and the other two conditions. Thus, some form of tax-cum-subsidy policy is the preferred form of intervention.

### Distribution on Final Exam

	Shrt.Ans.	Essay 1	Essay 2	Essay 3	Essay 4	Total	% Max
Mean	28	11	17	16	17	74	78
Std. Dev.	7	5	3	3	2	15	16
Min.	38	15	20	20	20	94	100
Max.	12	0	13	12	15	37	39

### Distribution on Semester Totals

	Sem. Avg	% Max	Exam 1	Exam 2	Exam 3	HW
Mean	60	83	55	55	74	57
Std.Dev.	10	13	11	14	15	15
Maximum	73	100	79	75	94	77
Minimum	47	65	43	34	37	38