ENSC 290 – Assignment # 2 Answer Key
Fall Term 2007

Q1) (i) There are a variety of possible reasons why WTA>WTP, including:
Sellers have more information about the asset than buyers, so do not discount the asset's value due to uncertainty.
Sellers have an "endowment effect" due to ownership (this effect may be related to the owners' ability to use the asset as collateral to get a preferential interest rate on the capital market).
Sellers may simply be reporting a higher initial value than buyers as an opening bargaining strategy.

Therefore, the correct response is: (e)

(ii) Mental account bias appears in CV studies when respondents don't report their valuation of the particular asset being valued in the study, but instead they report a value for all similar assets. This is often associated with symbolic bidding and/or embedding values for other assets into reported values. The result is very flat SMB curves, because marginal values are very insensitive to changes in the quantity of E being asked about.

Therefore, the correct response is: (e)

(iii) Environmental Kuznet's curves very rarely exist for consumption based pollutants. EKCs only imply that there will be a positive, then negative relationship between income and e for the average nation, not every nation (ie. there is no causation implied in EKCs). An inverted "U" implies a quadratic, not linear relationship between income and e (not e reduction). EKCs rarely exist when there is a disconnect between the geographic extent of damages and costs (ie. it is difficult to convince people to pay to reduce damages to individuals in other jurisdictions). However, EKCs do imply that e reduction is a luxury good and the income elasticity of demand for e reduction will, therefore, switch from negative to positive (or from inferior to normal).

Therefore, the correct response is: (c)

(iv) A PPF shifts outwards in the presence of improvements in environmental quality, technological change, or increased openness to trade. This increases the feasible consumption bundles, but this does not necessarily imply that welfare improves because PPFs and welfare functions measure different things. A ecological economists' definition of sustainability is non-decreasing welfare across generations, keeping in mind that a society can only generate welfare from feasible consumption bundles (ie. bundles that lie on or below their PPF). This implies that both welfare functions and PPFs matter for ecological economists' definition of sustainability.

Finally, environmental degradation shifts a society's PPF inwards, but other forces can offset this movement if they more than compensate for the reductions in E by increasing feasible consumption bundles. This, of course, assumes some substitutability among capital types.

Therefore, the correct response is: (c)

Note:

	Welfare	A NB as % Welfare	B NB as % Welfare
Bob	100	- 10%	100%
Joe	100	- 10%	50%
Jane	10	50%	0%
Mary	5	100%	200%

Horizontal equity: Net benefits as a % of welfare constant for individuals with equal welfare.

Vertical progressive: Net benefits as a % of welfare increase as welfare falls.

Vertical regressive: Net benefits as a % of welfare decrease as welfare falls.

Vertical proportional: Net benefits as a % welfare constant for all welfare levels.

(v) Costs and benefits on their own are irrelevant. Only net benefits matter. Jane and Mary are irrelevant to questions about horizontal equity because they have different welfare levels.
Policy A is not proportional, although if it was it would also be horizontally equitable.

Therefore the correct response is: (c)

(vi) Under Policy B Bob and Joe earn higher net benefits as a % of their welfare than Jane does, even though Bob and Joe's welfare is higher than Jane's. Jane still matters to us if she is part of our society. This implies that B cannot be progressive.

Therefore, the correct response is: (e)

(vii) Simply add up the costs and benefits for each individual.
Bob's NB as % welfare = 90%
Joe's NB as % welfare = 40%
Bob's NB as % welfare = 50%
Bob's NB as % welfare = 300%

First, we can never say a policy is "vertically inequitable". We know this aggregate policy cannot be horizontally equitable because Bob and Joe get different net benefits. We know this aggregate policy cannot be progressive because Jane gets a smaller % net benefits than Bob and she has lower welfare than Bob.

Therefore, the correct response is: (d)

Note: $SMB = 27 - 6E$
$SMC = 3E$

$SMB = SMC \Rightarrow E^{**} = 3$
$P^{**} = 9$

$PMB = PMC \Rightarrow E^{*} = 3$
$P^{*} = 3$

(viii) The correct response is: (e)

(ix) TPC = area under PMC between 0 and E**
= 0.5 x Base x Height
= 0.5 x 3 x 3 = 18/4 = 4.5

TPB = area under PMB between 0 and E**
= Base x Height + 0.5 x Base x Height
= 3 x 3 + 0.5 x 3 x (9 – 3) = 18

Therefore, the correct response is: (d)

(x) $SMB^{**} = SMC^{**} = P^{**} = \$9.00$

Therefore, the correct response is: (a)

Q2) Marks should be deducted for point form instead of full, coherent, concise and well focused sentences and paragraphs.

Marks should be deducted for rambling "brain dumps", even if all the relevant points are in the response somewhere.

Specific references to readings are not necessary, but if students have obviously done the readings and thought about how the readings help provide a full response, then this should be rewarded. In other words, good responses may be based exclusively on the lecture notes, but the very best responses will do more than reiterate lecture material.

Students must actually answer the question asked in their essay (ie. they must list and describe the 5 critiques, and they must explicitly link each critique to evidence presented in class or the readings).

Some points that should appear in most essays:

Because EKCs are based on reduced form estimates, rather than structural models, they depict correlation not causation, they suffer from omitted variable bias, and they do not pose any meaningful counterfactual. (eg. What would emissions have been if income had not increased?)

Much environmental degradation cannot be quantified, so we have no way of testing for EKCs.

EKCs are estimated with "flow" data for emissions, not stock data on aggregate environmental degradation. This is not a problem if emissions are not long lived in the environment, but if they accumulate, then the flow information is of limited relevance from a damage perspective.

EKCs have been estimated for emissions, but not resource use (aside from some limited deforestation estimates). This implies that we have no idea if there is a growth-resource trade off. Resource use is probably just like consumption pollutants (ie. constantly increasing with income).

Because EKCs are estimated using cross section data, the inverted "U" relationship may reflect pollution exporting from rich nations to poor nations.

Q3) (i) After controlling for all other characteristics of a job, then this statement is true. In other words, if you compare two jobs that are identical, but one exposes workers to pollution, then the dirty job should pay more.

(ii) If the SMC curve lies above the SMB curve for all values of E, then E** = 0, no matter what the characteristics of E (ie. the public good nature of E is a red herring).

(iii) Multiple choice question (iv) touches on a very similar point. Shifting the PPF does not necessarily generate more or less welfare. Shifting the PPF only changes the feasible production bundles. Society's welfare function then determines where on the PPF society will consume. It is possible that shifting the PPF inwards will leave welfare unchanged, or possibly even increase welfare, depending on the shape and position of the welfare function. Although in every case, shifting the PPF inwards does reduce the set of feasible consumption bundles.

(iv) The key here is the word “causes”. EKC depict correlation, not causation. This implies that even in the presence of an inverted “U”, we cannot say that growth *causes* any changes in pollution, only that there is a positive, then negative *correlation* between income growth and e.