Review Questions for the first exam

The following pages contain a list of questions that you should be able to answer given the readings and the material we have gone over in class. In preparing for the exam I recommend focusing on these questions, the key concept sheets, work completed in class, and old exams. In terms of graphs, you should make sure that you can quickly make graphs dealing with WTP/demand, MC/supply, consumer and producer surplus, public goods, positive or negative externalities, and policies to address externalities.

Copies of previous exams are on the old 350 home page: http://agecon2.tamu.edu/people/faculty/woodward-richard/350/. However, the material changes somewhat from one year to the next. So be aware that material included in previous years may not be the same as that covered this year.

You must understand the concepts, not simply be able to reiterate the answers to questions you’ve already seen.

- There will be one or more “clippings questions” in which you are asked to read a short article and answer questions that require that you apply economic concepts to the issues discussed in the article. See examples in old exams.
- There will be two RAT Repeat questions that will be adapted from RATs 1-4. These are short answer questions that address material directly considered in a question on a RAT.

YOU WILL BE ALLOWED TO BRING TO THE EXAM ONE 3X5 INCH NOTECARD WITH HANDWRITTEN NOTES ON BOTH SIDES OF THE CARD.

No calculators will be allowed. If calculations are necessary, you can simply write out the formula that you would type into your calculator.

**Value**

1. Referring to the graph below, answer the following questions.
   a. Why does the individual demand 1,000 units if the price is $20?
   b. Why would a firm want to supply 2,000 units if the price were $5?
   c. What is the equilibrium price and quantity? Why is this an equilibrium? Why is a lower price not an equilibrium? Why is a higher price not an equilibrium?
   d. What do we mean if we say that the equilibrium efficient in this case?

![Graph](image-url)
2. Consider the graph below. You should be able to answer many questions about this graph. 
   a) What is the MNB of the very first unit consumed?
   b) Identify the price that people would be willing to pay for the 300th unit.
   c) Identify the MNB of the 300th unit consumed.
   d) Identify the net benefits if 100 units are consumed.
   e) Identify the total costs if 200 units are consumed.
   f) Suppose you are evaluating a project to produce 300 units. What would be the benefits, what would be the costs, and would it pass a benefit cost test?
   g) Assuming that the characteristics of efficient property rights are satisfied, explain why the market clearing price is $40.
   h) What would be the economic measure of waste if the government does not allow the firm to produce more than 100 units?
   i) If creating each unit creates pollution that has an economic cost of $20, what would be the socially efficient quantity and why would the market lead to an inefficient outcome?
   j) If the benefits of the good are nonexclusive (i.e., when one person pays to have them created everyone in society benefits), will the market lead to an efficient allocation? Explain using an example economy in which there are only two people.

3. Some people argue that the environment cannot be valued while economists value environmental services based on the notion of willingness to pay. In intuitive language, why is willingness to pay a good measure of the benefits of an environmental service? (Consider the fact that real costs will probably have to be incurred if an environmental project is undertaken).

Cost

4. Suppose that the Texas Commission on Environmental Quality decides to regulate the pollution coming from cattle grazing operations in order to accomplish 2 things, improve water quality and improve habitat for endangered species. They will require each farmer to ensure that no manure will directly reach a waterbody (e.g. by fencing off the stream) and file reports with TCEQ every 6 months on the number of animals on their land.
   a. Identify two costs associated with this policy, one “out of pocket” cost and one cost that does not involve direct expenses.
   b. Since all economic costs are opportunity costs, indicate the opportunity that is foregone for each of the costs listed in your answer to a.
   c. Explain how the survey approach could be used to estimate the direct costs of this regulation.
   d. Explain how the engineering approach could be used to estimate the direct costs of this regulation.
5. Consider the regulation mentioned in question 4 that leads to water quality improvements and improves habitat for endangered species.

a. Using the value taxonomy above, identify a benefit that might be placed in each of the starred end points of graph.

b. What is a benefit, the value of which might be estimated using the travel cost method?

c. What is a benefit, the value of which might be estimated using the hedonic valuation method?

d. What is a benefit, the value of which might be estimated using the averting or defensive expenditures method?

e. What is a benefit, the value of which might be only estimated using a stated-preference approach such as the contingent valuation method?

6. The table below presents the number of trips taken to a river by a representative individual living various distances from river. The table presents the number of trips that are currently taken and the number of trips that are expected to be taken after the river has been cleaned up.

<table>
<thead>
<tr>
<th>Miles traveled</th>
<th>Travel cost per trip</th>
<th>Trips taken before clean-up</th>
<th>Trips taken after clean-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>$10</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>100</td>
<td>$20</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>150</td>
<td>$30</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>200</td>
<td>$40</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>250</td>
<td>$50</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

a. Using the data above and the travel-cost method, estimate the marginal willingness to pay for trips to the river and draw the resulting MWTP/Demand curve. Assume that the preferences of all people are identical, that is, the MWTP lines of all the people are identical, they only differ in where they live and, therefore, how much it costs to get to the river.

b. Estimate how much an individual living 150 miles from the river would be willing to pay for his or her 1st, 2nd, 3rd and 4th trip to the river before and after the clean-up.

c. Using the travel-cost method, show graphically the net benefits of the cleanup to an individual living 100 miles from the river.

d. For an individual living 100 miles from the river, estimate the willingness to pay for the cleanup (a dollar amount or an area from the graph).
Efficiency

7. Your Aunt Sue is a diehard environmentalist. She’s convinced that every environmental regulation needs to be stronger. In fact, she thinks that pollution should be illegal. Write a short e-mail message to your Aunt explaining why some level of pollution makes sense in terms of social efficiency.

8. Your Uncle Greg is a true believer in the free market. He’s convinced that every environmental regulation needs to be eliminated. Write a short e-mail message to your uncle explaining why some level of government regulation of pollution makes sense in terms of social efficiency.

9. Using a graph explain in words why some level of oil and gas development (e.g. “fracking”) is probably economically efficient, but why it also true that a completely unregulated industry will probably not achieve the economically efficient outcome.

Characteristics of efficient property rights, success & failure

10. The supply and demand curve below presents a market equilibrium in an economy in which all characteristics of efficient property rights are satisfied.

a. Explain in words why the market equilibrium $Q^*$ is said to lead to a socially efficient outcome.

b. How would the equilibrium quantity change if enforceability is not perfectly satisfied (e.g., if firms had to worry that many of their goods might be stolen)? Why would the resulting equilibrium not be economically efficient (i.e., would not maximize net benefits to society)?

c. How would the equilibrium quantity change if transferability is not perfectly satisfied (e.g., if you have to hire a lawyer every time you want to make a trade)? Explain. Why would the outcome not be economically efficient (i.e., would not maximize net benefits to society)?

d. How would the equilibrium quantity change if exclusivity is not perfectly satisfied because there are additional costs to production that are not captured in the MC curve. Explain. Why would the equilibrium outcome not be economically efficient (i.e., would not maximize net benefits to society)?

e. How would the equilibrium quantity change if exclusivity is not perfectly satisfied because there are additional benefits to production that are not included in the MWTP curve? Explain. Why would the outcome not be economically efficient (i.e., would not maximize net benefits to society)?
11. List the three characteristics of efficient property rights.
   a. Give an example of a market for a good or service in which all three characteristics are satisfied.
   b. Give three examples where one of the characteristics is not satisfied, one for each of the characteristics.

   Public goods and externalities

12. Consider the table below.
   a. Into which of the four cells would each of the following fit?
      A table in your house.
      A table in Evans library.
      The open space at a public park.
      Fruit on a tree at a public park.
   b. Not using any of those from a, identify two goods on the TAMU campus that fit into each cell in the table.

<table>
<thead>
<tr>
<th>Excludable</th>
<th>Non-Excludable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rival</td>
<td>Private Goods</td>
</tr>
<tr>
<td>Non-Rival</td>
<td>Club Goods</td>
</tr>
<tr>
<td></td>
<td>Public Goods</td>
</tr>
</tbody>
</table>

13. Al and Betty both value park land, which is non-rival and non-excludable. Their MWTP curves are presented in the figures below.
   a. On the graph on the right, draw the societal MWTP curve.
   b. Suppose that Betty has the ability to build parks and she can do so at a cost of $2 per acre. Approximately how many acres would she build if she is seeking to maximize her private welfare. Would this be socially efficient? Explain why or why not.
   c. Suppose now that Al, after seeing that Betty has built the parkland identified in b, learns that he too can build parks at a cost of $2 per acre. Approximately how many acres would he build if he is seeking to maximize his private welfare. Would this be socially efficient? Explain why or why not.
   d. If park development costs $2 per acre, what would be the socially optimal number of park acres? Would it be achieved through private actions?
   e. If park development costs $3 per acre, what would be the socially optimal number of park acres? Would it be achieved through private actions?
   f. Suppose that there are thousands of people like Al and thousands of people like Betty. What would be the socially optimal number of park acres?

14. What is an example of something that is part of the facilities or landscape of the A&M campus that is a pure public good (or very nearly so). Explain why it is both non-rival and non-excludable. Explain why this would not be provided at an efficient level by individuals acting independently.
15. Give an example of how the free-rider problem affects life at Texas A&M leading to an outcome that is not socially optimal.

16. Using the graph below, identify each of the following. Remember that marginal values should be vertical distances, while total values should be areas.

\[ MC_S \]
\[ MC_P \]
\[ D_P \]

a. The marginal external cost of the \( f^{th} \) unit.
b. The total external costs if the market equilibrium quantity of the good is provided.
c. The socially efficient quantity of the good.
d. The privately efficient (i.e. market) quantity of the good.
e. The welfare costs that arises without any kind of intervention in the market.
f. The welfare cost that would arise if production of the good were made illegal (i.e. restricted to zero).

**Environmental policies – taxes, subsidies, liability rules, Coaseian bargaining**

17. The graph below shows the Freddy’s willingness to pay to travel to Lake Wannabefishing. For example, he is willing to pay up to $80 for his first trip, but he would only pay up to $40 for his 5\textsuperscript{th} trip.
a. Assuming each trip costs $30, how many trips per year would Freddy take? Is this the privately efficient number of trips for Freddy?

b. Freddy uses his obnoxiously loud boat. In total, the other people at the lake would be willing to pay Freddy $10 per trip if he would go to another lake by himself. What is the socially efficient number of fishing trips to the Lake Wannabefishing?

c. Assuming that Freddy has the right to use the boat as much as he likes, explain how Coaseian bargaining might be used to change the outcome. Who would pay whom? What is the range on the dollar value of the payment.

d. Assume that the people living on the lake are unorganized so they can’t get together to pay Freddy $10 per trip. What is a policy that the local government might use to achieve the social optimum?

e. Suppose the local government simply decided to ban Freddy from the lake. Would this be social efficient? Explain why or why not.

18. You are a legislator and environmentalists are trying to convince you to put regulations on wakes generated by boats. You respond that it would probably be more efficient to simply make boat owners liable for any damage caused.

a. Using a graph, explain your point.

b. Suppose instead that you decide to fix the problem by requiring any boat owner seeking to create wakes to negotiate the right to do so with affected parties. Explain how such negotiations would lead to Pareto improvements relative to the no-wake policy suggested by your aids. You should be able to use a graph to help explain your answer.

Trademark permits policies

19. The graph below shows the marginal costs of cleaning up pollution by two firms, 1 and 2.

\[ \text{Graph showing marginal costs MC1 and MC2.} \]

a. Explain why requiring both firms to clean up 4 thousand tons would not be a cost effective way to clean up a total of eight thousand tons.

b. If a tax of $5 per ton of pollution were charged, how much pollution clean-up would be achieved?

c. Suppose the regulator wanted to achieve a total of 13 thousand tons of clean-up through a subsidy on pollution reduction. How much would she have to pay the firms per unit of pollution in order to achieve her goal?
d. Assume now that the regulator chooses to regulate through command and control policy in which each firm is required to clean-up exactly 5 thousand tons. Show graphically the total cost to the two firms of this policy.

e. If the firms were able to make trades away from the point where each cleans up 5-thousand tons, would any trading take place? If so, what is the range of prices that might have been agreeable to both firms for the first couple tons that they trade?

f. Suppose that in addition to allowing trading, the government tells the firms that they will be charged $5 per ton for every ton that they are out of compliance. So, for example, if a firm buys no credits and emits 6,000 tons (1,000 above its initial limit) it will have to pay a fine of $5,000. What would be the effect on the abatement by each firm? Would there be any trading?