“The first lesson of economics is scarcity: There is never enough of anything to satisfy all those who want it. The first lesson of politics is to disregard the first lesson of economics.” – Thomas Sowell

“Don’t cheat.” – Elon Honor Code (and Me)

**Instructions** – You have 100 minutes to complete the exam. Make sure to clearly label any graphs or curves you draw, and to clearly write out your answers for the True/False/Uncertain and Short Answer sections.

Good luck!
Multiple Choice – Please write your choice on the line next to each number. Choose the best answer. (2 pts each)

1. Suppose Susan can wash three windows per hour or she can iron six shirts per hour. Paul can wash two windows per hour or he can iron five shirts per hour.
   a. Susan has an absolute advantage over Paul in washing windows.
   b. Susan has a comparative advantage over Paul in washing windows.
   c. Paul has a comparative advantage over Susan in ironing shirts.
   d. All of the above are correct.
2. **D** Refer to the figure above. Which of the four panels represents the market for peanut butter after a major hurricane hits the peanut-growing south?
   a. Panel (a)
   b. Panel (b)
   c. Panel (c)
   d. Panel (d)

3. **B** Refer to the figure above. Which of the four panels represents the current market for automobiles after a top economist announces, economy-wide, wages and salaries are likely to fall in the near future?
   a. Panel (a)
   b. Panel (b)
   c. Panel (c)
   d. Panel (d)

4. **D** Equilibrium quantity will definitely decrease when
   a. demand increases and supply does not change, when demand does not change and supply decreases, and when both demand and supply decrease.
   b. demand increases and supply does not change, when demand does not change and supply increases, and when both demand and supply decrease.
   c. demand decreases and supply does not change, when demand does not change and supply increases, and when both demand and supply decrease.
   d. demand decreases and supply does not change, when demand does not change and supply decreases, and when both demand and supply decrease.

5. **A** Suppose roses are currently selling for $20 per dozen, but the equilibrium price of roses is $30 per dozen. We would expect a
   a. shortage to exist and the market price of roses to increase.
   b. shortage to exist and the market price of roses to decrease.
   c. surplus to exist and the market price of roses to increase.
   d. surplus to exist and the market price of roses to decrease.

6. **A** If the price of milk rises, when is the price elasticity of demand likely to be the lowest?
   a. immediately after the price increase
   b. one month after the price increase
   c. three months after the price increase
   d. one year after the price increase
7. **D** Suppose the equilibrium price of a physical examination ("physical") by a doctor is $200, and the government imposes a price floor of $150 per physical. As a result of the price floor,
   a. the demand curve of physicals increases.
   b. the supply of physicals decreases.
   c. the quantity demanded of physicals increases and the quantity supplied of physicals decreases.
   d. the number of physicals performed stays the same.

8. **C** When a tax is levied on buyers of a good,
   a. government collects too little revenue to justify the tax if the equilibrium quantity of the good decreases as a result of the tax.
   b. there is an increase in the quantity of the good supplied.
   c. a wedge is placed between the price buyers pay and the price sellers effectively receive.
   d. the effective price to buyers decreases because the demand curve shifts leftward.

9. **A** Denise values a stainless steel dishwasher for her new house at $500, but she succeeds in buying one for $350. Denise's consumer surplus is
   a. $150.
   b. $350.
   c. $500.
   d. $850.
10. **A** Refer to the figure above. If the price were P1, producer surplus would be represented by the area
a. F.
b. F+G.
c. D+H+F.
d. D+H+F+G+I.

11. **C** Refer to the figure above. From the figure it is apparent that
a. New Zealand will experience a shortage of wool if trade is not allowed.
b. New Zealand will experience a surplus of wool if trade is not allowed.
c. New Zealand has a comparative advantage in producing wool, relative to the rest of the world.
d. foreign countries have a comparative advantage in producing wool, relative to New Zealand.
12. **C** Refer to the figure above. When trade in wool is allowed, consumer surplus in New Zealand
   a. increases by the area B + D.
   b. increases by the area C + F.
   c. decreases by the area B + D.
   d. decreases by the area D + G.

13. **A** Since air pollution creates a negative externality,
   a. social welfare will be enhanced when some, but not all air pollution is eliminated.
   b. social welfare is optimal when all air pollution is eliminated.
   c. governments should encourage private firms to consider only private costs.
   d. the free market result maximizes social welfare.

14. **C** At the local park there is a playground for children to use. While anyone is allowed to use the playground, it is often very busy, reducing the enjoyment of many of the children who use it. The playground is a
   a. private good.
   b. natural monopoly.
   c. common resource.
   d. public good.

15. **A** According to the Coase theorem, in the presence of externalities
   a. private parties can bargain to reach an efficient outcome.
   b. government assistance is necessary to reach an efficient outcome.
   c. the assignment of legal rights can prevent externalities.
   d. the initial distribution of property rights will determine the efficient outcome.
True/False/Uncertain: Write True, False, or Uncertain in the space provided by the question. Also provide and explanation in the area that follows. You must explain your answer to get full credit. (14 pts)

16. **TRUE**

The PPF illustrates the concepts of scarcity, efficiency, and opportunity cost. (Your explanation must include a graph, use the axes provided below to illustrate your graph. Be sure to label the graph completely).

PPF

Answer: Opportunity cost is reflected in the slope of the PPC. It illustrates how much of one good, y, must be given up in order to produce more of the other, x. The decrease in y when moving from point A to B illustrates the opportunity of producing more x.

Efficiency is illustrated by the curve itself. Both points A and B are efficient, no resources are wasted when producing at these level - or any other production point along the curve. Point C and all other points within the curve are inefficient. At this point resources can be allocated more efficiently to increase production of x, y, or both goods.

Scarcity is reflected by the points outside the curve. Although point D (and all other levels of x and y outside the curve) may want to be produced and certainly exists, there are not enough resources available to produce them. Limited resources and unlimited wants and needs.

Short Answer: You must explain your answer to get full credit. Each explanation should be written such that someone who knows little to no economics can follow your reasoning. (14 pts each)

17. Your friend recently moved to a coastal town and he noticed that several boat wrecks have occurred due to the many rocky inlets along the coast. As a budding entrepreneur he begin to think of how to take advantage of this obvious need in the town. He come up with the idea of building several lighthouses along the coast. He showed the plans to all the local fisherman and explained how, by making a more than reasonable payment, they could ensure an optimal number of lighthouses will be built/maintained and their days of crashing into unseen rocks will be over.
What economic advice can you give your friend? Is his plan likely to be successful? Is it likely that the fishermen's monetary contributions will be enough to cover the costs of building a sufficient number of lighthouses? Why/why not? Explain. Use the supply-demand diagram to support/illustrate your claims.

**ANSWER:** I would advice my friend to find another idea. Most likely his plan will not be successful because not enough fisherman will voluntarily pay for the cost of the lighthouse. The economic reasoning is quite straightforward.

A public good has two unusual characteristics: nonrival consumption and nonexclusion. A good is nonrival if "consumption by one person need not interfere with consumption by others" (Browning and Browning 1987, 25). Nonexclusion means that it is extremely costly to confine the benefits of the product to selected individuals. The classic example of a public good is a lighthouse. Its signal is certainly nonrival, and it is nonexclusive because no individual sailor can be denied the benefits of the lighthouse without excessive cost. It is the nonexclusion characteristic that causes problems for a market economy because it creates the possibility that individuals can benefit without bearing any of the cost. This tendency of people to benefit without paying is called the free rider problem. Private firms that attempt to produce and sell a public good will find that the voluntary contributions of the beneficiaries are unlikely to be sufficient to cover costs. The result is that a suboptimal amount of the public good will be provided, if it is provided at all. This problem is equivalent to the problem of positive externalities. If left to the private sector, society will under produce this good, generating a DWL.

Graphically, the socially optimal level of production is $q_{\text{opt}}^*$. However, due to the positive externality generated by the public good - the lighthouse creates something of value which cannot have a price attached to it. Free riders will not contribute to the production of this good and leave the market. This results in an inward shift of the demand curve from $D$ to $D'$. Resulting in a new lower equilibrium, $q'$, and under production of this good by the private market. The under production is what generates the DWL. If this town wants to ensure $q_{\text{opt}}^*$ lighthouses are built a more probably thing to do would be for the local government to add a tax to boat licenses (thus internalizing the externality) which will raise revenue to pay for the construction/maintenance of the lighthouses.
18. In an effort to reduce pollution emissions throughout the state, the NC Department of Environmental Resources proposed implementing a statewide reduction of vehicle taxes to owners of hybrid vehicles. Explain why this policy has the potential to reach the state’s goal (i.e., reduce pollution) without the need of any additional regulation. Use the graphs provided to help explain your answer.

**ANSWER:** Hybrid vehicles require far less gas than 'other vehicles' and therefore create less pollution from burning gasoline. The goal of the government is to reduce pollution emissions, if they can create a policy which influences people to opt for a more fuel efficient vehicle then this will help meet their goal.

**Hybrid vehicles and other vehicles are substitutes in consumption.** Therefore a relatively lower price in one market will decrease the demand in the other market. The policy calls for a reduction in the vehicle tax on hybrid vehicles. This will result in a lower effective price for the buyer, price decreases from $p_{B1}$ to $p_{B2}$. The law of demand says when price increases quantity decreases so the price reduction in the Hybrid market will lead to an increase in the quantity demanded, from $q_1$ to $q_2$. Since Hybrids and Others Vehicles are substitutes the price reduction in the Hybrid Market will decrease demand in the Other Vehicles Market, demand decreases from $D$ to $D'$.

It is clear that this policy has the potential to reach the goals of the government. It influences people to switch from a more polluting production to one that is pollution reducing.

***NOTE*** You do not need to graph the existing tax in the 'others' market to receive full credit (you will neither be rewarded nor penalized). The point of the graphs is to illustrate the effects of the policy; i.e. what changes in each market. The policy does not change the tax in the 'others' market that's why it is not essential that you graph this point. You do however need to illustrate/discuss the fact that demand will decrease due to the drop in the price of a substitute (hybrids). In fact without making the point that D decreases you have not made an argument for the policy because the only reason pollution will decrease is because less people will demand 'other' vehicles. If the policy only meant a higher $Q_D$ of hybrids and no change in the 'other' market then this would mean pollution would actually increase.
19. Technological advances have allowed producers of electric razors to make improvements in their production processes.

a) Explain what affect this had on price and quantity in the electric razor market and why. Use the graph below to help explain your answer.

Answer: The technological improvements will increase the supply of electric razors. This is because better technology means lower costs of production for new firms. Meaning, they can produce more for lower cost. Everything else equal, this increase in supply will imply a decrease in price and an increase in quantity.

Unfortunately for the suppliers, however, this has also been a period in which their total revenues have plunged.

b) In terms of elasticity, what must be true for these two events (lower revenue and more output) to have occurred? Use the graph below to support your claims.

Answer: The total revenue obtained by the seller is equivalent to the total expenditure made by consumers (P*Q).

After a price reduction, total expenditure can:

(i) increase (if the effect on the increase in quantity dominates)
(ii) decrease (if the reduction on price dominates).

In the first case, the elasticity should be bigger than one (elastic), the quantity demanded is highly responsive to a change in price; and in the second less than one (inelastic), the change in demand is not very responsive to a change in price. Given that the observed result was a decrease in total revenue, the demand would be inelastic between the original and the new equilibrium.
20. The number of low-income families residing in Durham has been steadily increasing over the last several years. Durham officials are concerned with the growing lack of affordable low income housing. They are evaluating two policy alternatives: 

i. to offer a subsidy of amount ‘s’ on rentals or

ii. to impose a price ceiling on rentals that is exactly ‘s’ (the same amount of the subsidy in (i)) less than the actual equilibrium price.

Assume that this market is originally in equilibrium. Which of these two alternatives would you recommend? Why? Be sure to provide economic intuition (like efficiency concerns) in your answer. Use the graphs provided to help explain your answer; be sure to label the appropriate prices, quantities, etc in each graph.

Answer: There are two major goals of this policy 1) decrease the price of housing available to low-income families and 2) increase the number of housing units available to low-income families. Although policy ii does a better job at reducing the price only first price both lowers the price and increases available housing.

Policy (i) - The subsidy of size s will benefit the landlords as well as the tenants because they will share the benefits of the subsidy. The price the tenant pays is lower, $p_B < p^*$, and the price the landlord receives is higher, $p_S > p^*$. So even though this policy will also end up benefiting the landlord (which is not the policy goal) it is this very benefit which will increase the number of housing units supplied on the market, $q_S > q^*$.

Policy (ii) - The ceiling is a mandatory maximum price the seller receives so, unlike in policy (i), because the price sellers receive is lower, $p_C < p^*$, the quantity of housing units supplied to the market will decrease, $q_C < q^*$. The landlords are definitely worse off. The tenants who ARE able to find housing are...
much better off however, there will be considerable less units available so those tenants who cannot find housing will be much worse off. It is not clear whether CS increases or decreases in this case but PS definitely decreases.

From and efficiency perspective policy (i) is far more efficient because there is a much larger total surplus in this market. Note that \((p^*-p_C) = s\) but \((p^*-p_B) < s\) because in policy (i) the landlord and seller share the subsidy while in policy (ii) the entire benefit of the price reduction goes to the tenant. As a result the change in the market price is much greater under the second policy. Since the change in price is much larger under policy (ii) the change in quantity (or market distortion) will also be much greater. And since the market distortion is larger the change in surplus will (or DWL) will be greater under the second policy. It is clear the \(DWLi = g < b+d = DWLi\).

My recommendation would be policy I because under this policy the price tenants pay will be slightly lower AND there will be more low cost housing available which is the primary objective. Finally this policy is more efficient so the loss in total surplus in this market will be minimal. Unfortunately, this policy will also mean the government is responsible for providing the subsidy. The money to fund the subsidy = \(b+c+d+e+f+g\) would mean increased taxes or debt for the local government. Provided these funds are within the government's budget, the subsidy is the more attractive policy.