This is the guide to Fall 2014, Midterm 1, Form A. If you have another form, the answers will be different, but the solution will be the same. Please consult your TA or instructor if you think there is an error in the guide – it is not guaranteed to be mistake free.

1) Your answer to this question is what form of the exam you had. The answer is A if you have form A. The answer is B if you have form B etc.

2) The price of corn decreases and corn is an input into the production of ethanol. Decrease in the price of an input shifts the supply curve down and to the right. Therefore, the equilibrium quantity of ethanol increases and the equilibrium price of ethanol decreases. The answer is C.

3) The price of crude oil decreases. Crude oil is a substitute for ethanol. A decrease in the price of a substitute shifts demand down and to the left. Therefore the equilibrium quantity of ethanol decreases and the equilibrium price of ethanol decreases. The answer is D.

4) From the two questions above we know that the supply curve will shift down and to the right and the demand curve will shift down and to the left. We do not, however, know the magnitude of these shifts. Since both shifts cause the equilibrium price of ethanol to decrease we know that the equilibrium price will decrease when both curves shift. However, since the two shifts move the equilibrium quantity in opposite directions we do not know the effect on equilibrium quantity of ethanol. The answer is D.

5) We are told that the price of a complement increases. Therefore, the demand curve moves down and to the left. We are told that the price of a widget decreases but the quantity remains unchanged. If we had a standard supply curve with a positive slope we would expect the equilibrium quantity to decrease and the equilibrium price to decrease. Therefore, it must be that the supply curve is a vertical line so that the equilibrium quantity remains unchanged. The supply curve must be inelastic. The answer is D.

6) We are told demand is unit elastic, this means that the following an increase in prices of 1%, demand decreases 1%. Similarly, supply is unit elastic, i.e. an increase in prices of 1% will increase supply by 1%. Also we know that in order for consumers to bear the whole tax burden, demand should be perfectly inelastic (the more inelastic part of the market bears the burden), which is not the case. If producers were to bear 100% of the tax burden, supply should be perfectly inelastic, which is not true either. If we draw the curves, we can see how both consumers and producers are losing surplus following the introduction of the tax: consumers end up paying a higher price, producers receive a lower one compared to before, and total quantity is reduced.
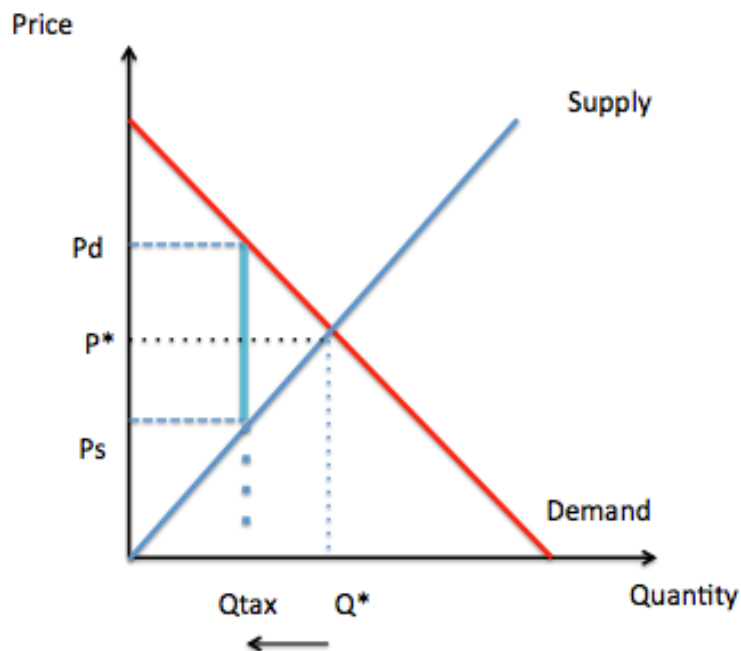
Hence, since they are all unit elastic, it has to be that both consumers and producers share the tax burden. The answer is C.

7) First realize this is a violation or Principle 2: efficient production. S2 has a lower cost, so should produce before S9 does. Thus, it is not Pareto Efficient. In order for S2 to produce he needs to break even, so at least needs to make $2 to cover the cost of production. This rules out b) and c) as answers, because S2 wouldn't be better off by producing, since he would be losing money. S9 also has to make less of a loss by paying S2 to produce and don't make a widget, compared to the initial situation when he is producing with a cost of 9. In answer a) he would have to pay $10 to S2 so that's even worse than producing at a cost of $9. We can see that if S9 pays $2.01 to S2, S2 would be better off (in particular $0.01 better off) compared to not producing, and S9 would only have to pay $2.01 to get that unit instead of producing it Both would be better off compared to the initial situation, which is a Pareto improvement. Then, the right answer is D.

8) From the First Welfare Theorem we know what the market will ensure the equilibrium allocation is Pareto Efficient under three principles:

P1. Efficiency in consumption. Consumers with high reservation values should consume first. D1 is the consumer with the highest valuation, D2 the second one and so on. Since D1-D5 consume and they are ranked from highest to lowest reservation values , this principle is satisfied.

P2. Efficiency in production: producers with lowest costs should produce and sell first. We see that S1-S5 are ranked from lowest to highest costs and they all sell, so this principle is satisfied too.

P3. Efficient quantity: marginal reservation value of the last buyer should be equal to marginal cost of last seller. Last buyer is D5 with a reservation value of 5. Last seller is S5 with cost 5. Since both are equal, the quantity is efficient.

Hence the allocation is Pareto Efficient. Since none of the answers recognize that there is Pareto efficiency in the allocation, the answer is E.

9) The best way to see this is with an example. Suppose demand is unit elastic and supply is perfectly inelastic. There are no externalities and the market is perfectly competitive, so the assumptions for 1st welfare theorem are satisfied, hence the market equilibrium (P=5,Q=5) is Pareto Efficient.
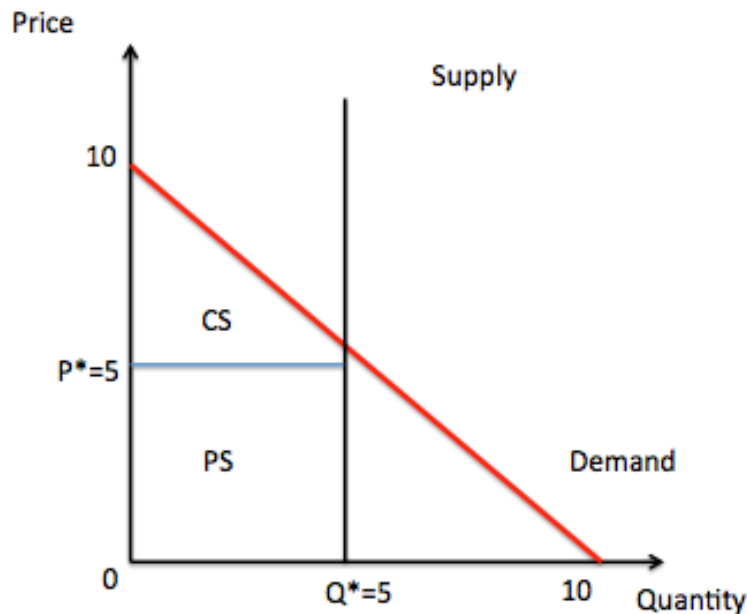
However, we see that the share of surplus that consumers and producers will receive depends on the elasticity of their curves. CS= 0.5*5*5=12.5 and producer surplus is 25. Hence we see the allocation is Pareto Efficient, but consumer surplus is different than producer surplus. The answer to the question is false, and is B.

10) In the unregulated market, the equilibrium price is such that $Q^D=Q^S$, hence Excess Demand = $Q^D - Q^S = 0$. The answer is A.

11) In the unregulated market consumer surplus is the area under the demand curve and above the equilibrium price line. In this case the equilibrium price line is the horizontal line at $P^{EQ} = 5$. That

area is a triangle and we use the formula for the area of a triangle to calculate the consumer surplus. In this case CS= (10-5)x5/2 = 12.5. The answer is C

12) Recall that a government tax or subsidy puts a wedge between the price that the consumers pay and the price that the producers get. $P^D = Tax + P^S$. In this case we have a subsidy of $6 hence Tax = -$6. This implies that the equilibrium quantity is where $P^D = -6+ P^S$. This happens when Q=8, because in this case $P^D = 2$ and $P^S = 8$. Hence the equilibrium quantity is 8. The answer is D

13) In the previous question we found that when there is a $6 subsidy, there is a production of 8 widgets in the economy. The government is paying $6 per widget and hence total government expenditure = $6 x 8 = $48. The answer is C

14) The deadweight loss of a $6 subsidy is due to the marginal cost of sellers higher than the marginal benefit of buyers. In the graph, the deadweight loss corresponds to the area in which the supply curve is above the demand. The area of the triangle corresponding to the deadweight loss is (1/2)x(8 - 2)x(8 - 5) = 9. Since it is a loss, - 9. The answer is E.

15) A price ceiling establishes the maximum price in the market. With a price ceiling of $2, only two sellers accept to sell and 8 buyers will demand the widget. The excess demand is Q(D) – Q(S) = 8 – 2 = 6. The answer is D.

16) With perfectly inefficient rationing the buyers with the lowest reservation value will acquire the widget. As consequence, consumer surplus is minimized.
CS = (1/2)x(8 - 6)x(4 - 2) = 2. The answer is B.

17) A price floor establishes the minimum price in the market. A price floor of $2 is below the equilibrium and it is not a binding constraint. That is, it does not affect market allocation. The consumer surplus is calculated as usual, CS = (1/2)x(5 - 0)X(10 - 5) = 12.5. The answer is C.

18) The policy caps the total amount of quota at 4 units. So the owner of a quota face the following decisions If produce, profit for selling the good are given by $2 = $6-$4 = Pd - Ps. If he sells the quota, he gets the Price of the quota, Pq. Hence in equilibrium it must be the case that the Price of the quota equals the profits that the firm makes by producing. Hence the equilibrium Price of the quota is $2. The answer is B.

19) From the Reading 5. The answer is D.

20) The First Welfare Theorem requires of certain assumptions in order to hold. In particular, the fact that are no externalities in the market, and that market structure is in perfect competition are the

ones required from the list above. With no externalities social valuations are equal to private valuations, hence efficiency can be reached when private surpluses are maximized. Perfect competition implies that individual actions do not affect other individual decisions. The answer is D.

21) Notice that, while keeping everything else is constant, we are looking at own price elasticity. The percentage change in quantity is equal to a 50% = (5-3)/4, while the percentage change in Price is equal 20% = (9-11)/20. Hence the demand is elastic. The answer is B.

22) To estimate the long run demand elasticity of gasoline, we must make sure that the other factors that may affect changes in the quantity demanded (income, price of substitutes, etc) are constant or fixed. For one, public transit is better in Norway in comparison to the USA, thus providing public alternatives to driving. Since public transportation is a substitute then we need to consider its effects on the quantity demanded. This means that when calculating the long run demand elasticity of gasoline, we are giving too much credit to the effect of the price of gasoline on the quantity demanded of gasoline. In other words, the change in the demand of gasoline is not only affected by the change in the price of gasoline but also by the price of public transportation. As we are not controlling for the price of public transportation, then our estimate of the long run elasticity of demand includes both the effect of the price of gasoline and also the price of the public transportation. Hence, we are over estimating the demand elasticity of gasoline. The answer is B.

23) By choosing data from the same months, June, in the different years we are controlling for seasonal patterns, as we are comparing from the same months. If instead we had compared June 2008 to December 2007, then we would not be doing so. In December, people are more likely to consume more gasoline in comparison to June by travelling to visit relatives as well as by taking more trips to the mall to buy presents. Hence the comparison in between December 2007 and June 2008 would not be valid in the sense that the consumption (demand) patterns of gasoline in between these two months are most likely different. By choosing data points from the same month we are controlling for the fact that demand of gasoline may be different in between the twelve months of the year, hence we are controlling for season patters. The answer is A.

24) If the demand of gasoline increases with income then gasoline must be a normal good. A normal good is a good in which the quantity demanded increases when income increases. If the income in China were to increase substantially, since gasoline is a normal good, then we would expect the demand of gasoline to increase. The answer is D.

25) To find the price that clears the market we must line up sellers in ascending order with respect to their bid (from the lowest bid to the highest bid). Also, we must line up the buyers in descending order with respect to their bid (from the highest bid to the lowest bid):

Buyers	Bid (Offer to buy in $)	Sellers	Bid (Offer to sell in $)
Elizabeth	21	Brett	5
Aretha	20	Allie	17
Charles	20	David	17
Dane	19	Cindy	19
Bill	17	Earl	20

The price that clears the market ensures that the quantity demanded equals the quantity supplied. At price $19 we have that 4 buyers demand and 4 sellers supply. The answer is C.

26) Here we need to rank the sellers in ascending order and the buyers in descending order. The ranks for sellers are Brett, Allie, David, Cindy, Earl. The ranks for buyers are Elizabeth, Aretha, Charles, Dane, Bill. If we match up buyers with sellers, we see that we can match up buyer reservation prices with seller production costs until Cindy and Dane, where the marginal reservation price is equal to the marginal cost. Therefore, in the market clearing allocation we have both Aretha and Brett buying and selling. The answer is B.

27) Here we need to look at each of the curves and determine their elasticity. If we look at the demand curve, in particular, we see that this curve is strictly vertical. We see that no matter the price, the same quantity is always demanded. Since this meets our definition of perfect inelasticity, we can see that the demand curve is perfectly inelastic. The answer is A.

28) By definition the producer surplus is the difference between the price a producer receives for the good and the producer's own cost to produce the good. Therefore, we find the area between the equilibrium price and the supply curve. This area is EGR. The answer is B.

29) If the market price is set to $8, we insert an $8 price line into our current market. From this we see that there is a difference between the quantity supplied and the quantity demanded in the market. Since the quantity supplied is greater than the quantity demanded we have a case of excess supply. The quantity supplied is 8 widgets and the quantity demanded is 5 widgets. Since there are 3 widgets in surplus, the government will buy up these extra widgets, according to the

policy described. If the government buys 3 widgets at a price of $8, the total expenditure will be $24=$8*3. The answer is C.

30) Whenever there is a side of the market that is perfectly inelastic, just go back to the case that is normal and see that a tax wedge is simply a line that goes from the demand curve down to the supply curve. So, we will want to find a wedge such that it starts from the demand curve and then goes straight down to the supply curve. The only way we can do that is as follows:
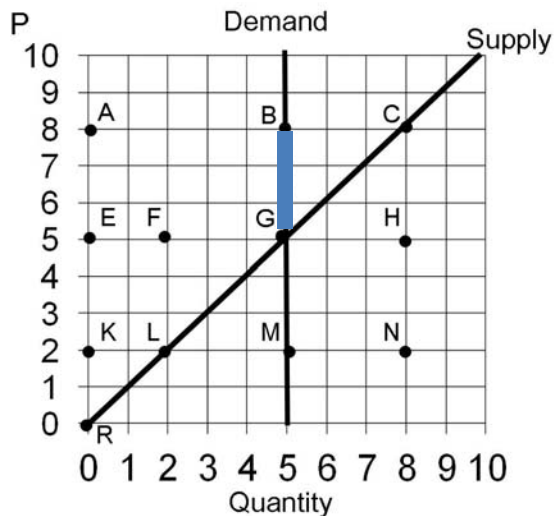
The blue wedge there represents a tax of $3, and it starts from the demand curve and goes down to the supply curve. After drawing this wedge, we can see that the area that the government will receive from this tax is the amount of the tax, $3,times the quantity that is in the market after the tax, which is 5. The area that corresponds to this is ABGE. The answer is D.

31) Looking at the graph above, we see that the quantity after the $3 tax is the same as if there was no tax (the free market). This is because when a side of a market is perfectly inelastic (here, the demand side), there will be no deadweight loss from the tax, as the tax does not distort quantity. We can see that graphically, the total surplus from the free market is the same as the total surplus after the tax. Therefore, the answer is B.

32) By definition, a luxury good is a type of normal good where when your income increases, your spending share of that good increases as well. Therefore, if income is increasing, then we would expect the share of income spent on fine dining to increase as well. The answer is D.

33) We discussed in class about alternative ways to tax the market, and saw that a head tax (where you tax people instead of a market), is more efficient. In fact, there will be no deadweight loss that comes from such a tax, since the market is not distorted. However, if the head tax causes less people to live in Econland, then we will also be distorting the quantity of the free market. So, a head tax that does not distort quantity, or change the number of inhabitants in Econland, will have no deadweight loss. The answer is B.