CONCORDIA UNIVERSITY
Department of Economics

ECON 201

MIDTERM EXAMINATION WITH ANSWERS

Multiple Choice Questions (3 marks each).

1. Suppose you give up a job that pays $30,000 a year in order to pursue your university education. Every year, you pay $4,000 for tuition and books, and $16,000 for food and rent. What is your opportunity cost of spending one year in university?
   a) $ 46,000.
   b) $ 50,000.
   c) $ 34,000.
   d) $ 30,000.

2. Suppose that Zoe and Ben can produce bar soaps and DVDs. For a given day, Zoe can make either 10 soaps and 0 DVD or 0 soaps and 20 DVDs or other combinations in between. Ben can make either 5 soaps and 0 DVDs or 0 soaps and 15 DVDs or other combinations in between. Assuming that Zoe and Ben are self-sufficient and they split their day to produce both soaps and DVDs. What would be the consumption bundles for Zoe and Ben?
   a) Zoe consumes (5S, 20DVD) and Ben consumes (5S, 10DVD).
   b) Zoe consumes (10S, 10DVD) and Ben consumes (5S, 7.5DVD).
   c) Zoe consumes (8S, 2DVD) and Ben consumes (5S, 8DVD).
   d) Zoe consumes (5S, 10DVD) and Ben consumes (2.5S, 7.5DVD).

3. A basket of goods in 2005 costs $625, while the value of the same basket in 2010 costs $800. If the base year is 2005, what is the value of this price index in 2005?
   a) 100.
   b) 78.125.
   c) 128.
   d) 155.

4. Which of the following would be considered as cross section data?
   a) The mortgage payments of Anna, Ben and John between 2005 and 2010.
   b) The rise in the cost of living over the past five years.
   c) Inflation rates between 1990 and 2010.
   d) The income and gasoline consumption of 1,000 residents in Montreal in 2012.

5. If the demand equation changes from P=25-6Q to P=30-6Q, which of the following statements is CORRECT?
   a) The demand for this product has decreased, which is a shift to the right.
   b) The demand for this product has increased, which is a shift to the right.
   c) The demand for this product has decreased, which is a shift to the left.
   d) The demand for this product has increased, which is a shift to the left.

6. Suppose the demand equation is given by P=10-Q and the supply equation is given by P=2+Q. If the quantity bought and sold under a price ceiling is Q=2, what is the price ceiling?
   a) $5.
   b) $3.
   c) $2.
   d) $4.

7. Which of the following statements is INCORRECT?
   a) Normal goods have income elasticities that are positive.
   b) Inferior goods have income elasticities that are negative.
   c) Luxury goods have very high income elasticities.
   d) Necessity goods must also be inferior goods.

8. In Quebec, margarine is not allowed to be labeled as "tastes like butter" because of the lobbying efforts of butter manufacturers. The butter producers are trying to
   a) Decrease the income elasticity of butter.
   b) Increase the price elasticity of butter.
   c) Decrease the price elasticity of butter.
   d) Increase the income elasticity of butter.

9. If the government imposes a percentage tax on the consumers, the more inelastic the supply curve, the
   a) The lower the tax revenue.
   b) Larger the deadweight loss.
   c) Smaller the drop in equilibrium quantity.
   d) All of the answers are correct.

10. A marginal abatement curve is ____ -sloped because the cost associated with achieving close-to-zero pollution is much ____ than cleaning up just a bit of the existing pollution.
   a) Negatively; higher
   b) Negatively; lower
   c) Positively; lower
   d) Positively; higher

Part II: Answer all questions (total of 70 marks)

1. (20 marks) Suppose the government wants to subsidize the production of corn. Assume that the demand for corn is given by P=10-Q and the supply is given by P= 2+Q. Suppose the value of the subsidy is $2 per unit and it is given to producers.

(i) What is the free market equilibrium quantity and price before the subsidy and is it efficient? (6 marks)

10-Q=2+Q, so Q=4 and P=6. If there is no externality, this equilibrium is efficient.

(ii) What is the quantity and prices for consumers and producers after the subsidy? (7 marks)

Since subsidy is given to producers, supply curve becomes P=Q. So, new equilibrium is where 10-Q=Q, so Q=5, Pc=5 and Pp=7.

(iii) Is there a deadweight loss (DWL) and how much is it? (7 marks)

Yes, DWL =2*1/2=$1.

2. (20 marks) Suppose the demand curve equation is P=15-3Q.

(i) Find the arc elasticity when price drops from 9 to 6 dollars. (8 marks)

When P=9, Q=2 and when P=6, Q=3. So arc elasticity is (deltaQ/deltaP)*Avg.P/Avg.Q= -1/3*7.5/2.5= -1.

(ii) Does total expenditure/revenue increase or decrease following this price drop? (6 marks)

Before drop TE=P*Q=9*2=18, after TE=P*Q=6*3=18, so TE has remained the same.

(iii) What is the price and quantity that will maximize total expenditure/revenue and what is the maximum expenditure/revenue? (6 marks)

It is when point elasticity is -1, at the mid-point of the demand curve, i.e. where P=7.5 and Q=2.5. The maximize expenditure then is (7.5)*(2.5)= 18.75.

3. (30 marks) Suppose that in the market for gasoline, demand is P = 150 - Q. The private cost of producing gasoline, or supply, is P = 10 + Q. However, pollution generated by the production process creates a per unit external harm (negative externality) equal to 0.5Q. The socially responsible supply is simply P = 10 + 1.5Q.

(i) What is the private market equilibrium price and quantity if the externality is not corrected for and the socially optimal quantity? (8 marks)

The unregulated market equilibrium is characterized by the intersection of the private cost curve and the demand curve. Thus, 150 – Q = 10 + Q. The market equilibrium quantity is Q = 70. The market equilibrium price is P = $80

Socially optimal equilibrium is characterized by the intersection of the social cost curve and the demand curve. The social cost is given by 10 + 1.5Q. Thus the socially optimal quantity is given by 150 – Q = 10 + 1.5Q. The socially optimal quantity is Q = 56.

(ii) Suppose that the government wants to achieve the socially optimal quantity by imposing a tax on the producers. What would be the size of the tax in dollars per unit of gasoline? (7 marks)

We know that we want the output to be 56 units. To sell 56 units, we know that the consumers are willing to pay $94. To produce 56 units, we know that the firms only need to receive a price equal to P = 10 + Q (=56) or P = $66. This means that if the government charges a tax of $94 - $66 = $28 per unit, the firms will produce only 56 units.

(iii) Calculate the changes in consumer surplus (CS), producer surplus (PS), social cost (SC), government tax revenue (TR) and total surplus (TS) (changes in CS, PS, SC and TR taken together) as a result of the tax (assume the supply curve with the tax from (ii) is the socially responsible one with equation P=10+1.5Q). (8 marks)

Change in CS= (70+56)*14/2= 882 (loss)
Change in PS= (70+56)*14/2= 882 (loss)
Change in GR= 28*56= 1568 (gain)
Change in SC= 35*14/2+28*14/2= 441 (gain)
Change in TS= -882-882+1568+441= 245 (gain)

(iv) Which TS (before or after the tax) is bigger, by how much and why? (7 marks)

TS after the tax is bigger by $245, because the tax has moved the economy from an inefficient allocation to an efficient one, by internalizing the cost of negative externality.