**EC100 - Introduction to Economics** **Name:** _____
**Spring 2015** **Student ID:** _____
**Final Exam**
**07/07/2015**
**Time: 150 minutes** **Professor:** Andrés Castaño Zuluaga *M.Sc.*

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This exam contains four pages and a total of 10 questions. Next to each question is its weighting according to a maximum of 60 points (10 base points). Enter the required information at the top of the sheet. Questions 1 to 5 are multiple choice with a single answer. The answer must be justified on the blank sheets provided. Only a calculator is allowed.

**Notes:** The questions that require math, either algebraic or numerical, must be solved on the blank sheets provided (do not solve on the exam sheets)

1. (3 points) If the demand curve for a certain good is elastic, it should be expected that if there is an increase in the price of the good:
    A. The quantity of the good consumed decreases more than proportionally to the price increase, increasing the seller's total revenue.
    B. The quantity of the good consumed decreases less than proportionally to the price increase, increasing the seller's total revenue.
    C. The quantity of the good consumed decreases more than proportionally to the price increase, decreasing the seller's total revenue.
    D. The quantity of the good consumed decreases less than proportionally to the price increase, decreasing the seller's total revenue.
    E. None of the above.

2. (3 points) In fixing a maximum price for a certain product by economic policy designers, it would be expected that:
    A. To be effective, it must be below the equilibrium price, cause excess supply, and cause discrimination based on seller bias.
    B. To be effective, it must be above the equilibrium price, cause excess demand, and cause discrimination based on seller bias.
    C. To be effective, it must be above the equilibrium price, cause excess supply, and cause long lines in acquiring the good.
    D. To be effective, it must be below the equilibrium price, cause excess demand, and cause discrimination based on seller bias.
    E. None of the above.

3. (3 points) If the government decides to set the minimum wage paid to workers, it would be expected that:
    A. If it is set above the equilibrium wage, it causes an excess demand for labor and therefore increases unemployment.
    B. If it is set above the equilibrium wage, it causes an excess labor supply, and therefore unemployment decreases.
    C. If it is set below the equilibrium wage, it causes an excess demand for labor, and therefore unemployment decreases.
    D. If it is set above the equilibrium wage, it causes an excess demand for labor, and therefore unemployment decreases.
    E. None of the above.

4. (3 points) The existence of what is called the income effect is due to the fact that:
   A. The good that becomes relatively cheaper is consumed more.
   B. Some goods are inferior goods.
   C. Varying prices change our real income.
   D. None of the above.

5. (3 points) Suppose an individual faces prices $p_1$ =0 and $p_2$ =10 with income m = 200. The individual's budget constraint has the form:
   A. A parallel line to the $X_1$ axis at the height of the maximum consumable amount of $X_2$.
   B. A parallel line to the $X_2$ axis at the height of the maximum consumable amount of $X_1$.
   C. The conventional way, with cut points on both the $X_1$ axis and the $X_2$ axis at their maximum possible consumption.
   D. There is no budget constraint.

6. (7 points) To improve tax revenue, the Government is considering a consumption tax on good X. The Government believes that both the demand and supply of this good are not very sensitive to price changes. Therefore. a value-added tax of 20% would not cause significant harm to consumers and sellers. To corroborate his belief, the Government hires an economist to determine the true demand and supply elasticity of this good. After three months of investigation, the economist finds that the Price Elasticity of Demand (PED) of good X is $-1.5$ while the Price Elasticity of Supply (PES) is 2.0. Given these circumstances, if the purpose of the Government remains the same, what would the economist advise regarding the magnitude of the initial tax (graph and justify your answer)

7. (6 points) , what implications do the following situations have within consumer theory (Explain and graph, if necessary):
   A. That two indifference curves intersect.
   B. That the indifference curves are convex.
   C. That the market's Marginal Rate of Substitution ($RMS_M$) is equal to the individual's Marginal Rate of Substitution ($RMS_I$)

8. (8 points) Assume the following demand function:

$$Q_x = 200 - 2P_x - 3P_y$$

   where $Q_x$ is the quantity demanded of x, $P_x$ is the price of x, and $P_y$ is the price of y.

   Solve the following:
   A. (4 points) Suppose only four points of the demand function are known:

| Point | $P_x$ | $P_y$ |
|---|---|---|
| A | 6 | 5 |
| B | 8 | 7 |
| C | 10 | 10 |
| D | 8 | 5 |

      When possible, calculate the $e_{PQ}^{QD}$ using the arc elasticity formula.
   B. (4 points) Use the data from question A to calculate the $E_{PR}^{QD}$, where possible. Interpret all the results obtained in both A and B, and indicate what type of goods each example refers to.

9. (12 points) Suppose a private security service market has many buyers and sellers. The demand and supply functions are as follows:

$$Q_D = 1100 - P$$

$$Q_S = 20P - 1000$$

$Q_D$ is the quantity demanded, $Q_S$ is the quantity supplied, measured in the number of guards/month, and P is the price in units of \$1,000.

Solve the following:

A. (3 points) Calculate and graph the market equilibrium in this market and explain its meaning.

B. (3 points) Suppose the government decides to charge security companies a tax of \$10,000 (10 P units) for each security guard/month they use in the services provided to their users. Calculate the new equilibrium situation in the market. Graph the new equilibrium.

C. (6 points) Calculate and explain the effects of the government policy on consumer surplus, seller surplus, state revenue, and "welfare". Indicate each one on the graph from point B.

10. (12 points) A consumer good is acquired in a perfectly competitive market with demand and supply functions:

$$Q_S = 40P - 2000$$

$$Q_D = 40000 - 100P$$

$Q_D$ is the quantity demanded, $Q_S$ is the quantity supplied, and P is the price. Because it is a relatively luxurious good, the government assumes that consumers are high-income and decides to charge producers a tax of \$45 for each unit they sell. Solve the following:

A. (4 points) Calculate the effect of this tax on the market equilibrium. Show your results in a graph.

B. (8 points) In protest, because their profits have fallen due to the new tax, the producers threaten to close their firms, leaving many workers unemployed and transferring their capital to other activities. They say that each unit produced costs them \$200. The government says that the money it collects from these taxes is dedicated to financing the Police to improve the surveillance service in the sector where the producers of this good are located. Therefore, if the producers account for the new surveillance service cost, their profits will increase. Is what the government says correct? Show and calculate. Present the corresponding graph.

11. (5 points) (BONUS) Suppose the market for good X has the following demand and supply functions:

$$X_D = 100P^{-1} - \frac{1}{2}Y$$

$$X_S = 40 + 16P$$

Where $X_D$ is the quantity demanded, $X_S$ is the quantity supplied, P is the price, and Y is the income of consumers.

Solve the following:

A. (3 points) Find the equilibrium situation in the market when $Y$ =300 and $Y$ =200. Show the results on a graph.

B. (2 points) Calculate the $E_R^{QD}$ of good X? What kind of good is X? Explain the concepts you use for your calculations and display the results on a graph.