HOWARD UNIVERSITY

DEPARTMENT OF ECONOMICS

CODE NUMBER _____ TOTAL NUMBER OF PAGES____

DATE_____

COMPREHENSIVE EXAMINATION: Fall 2016 Microeconomics Theory MA

EXAMINERS:

1. **Dr. Omari H. Swinton, Chairperson**
2. **Dr. Emily Blank**
3. **Dr. Zhun Xu**

1. **The examination is scheduled between the hours: 9:30 a.m-1.00 pm**

   ALL STUDENTS ARE TO BE SEATED BY 9:15 a.m.
2. **YOU ARE REQUIRED TO ANSWER ONLY FIVE (5) QUESTIONS.**

   Any additional questions answered over the required number from each category will NOT receive credit.
3. **Correct answers to questions NOT asked will receive NO credit.**
4. **Be sure to write the Code Number assigned to you in the TOP LEFT HAND CORNER OF THIS SHEET AND ON EACH ANSWER SHEET. DO NOT WRITE YOUR NAME ON ANY SHEET OF THE EXAMINATION.**
5. **Begin each question on a new page. Number each page used in sequence. Write only on one side of the paper.**
6. **Write clearly and illustrate your answers with graphs whenever and wherever possible.**
7. **USE ONLY BLACK INK PENS.**
8. **At the end of the examination, please indicate the total number of pages being submitted in the space provided in the TOP RIGHT HAND CORNER of this sheet.**

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1. **Bring your pens, pencils, calculators and rulers.**
2. **No briefcases, book bags or sacks, no handbags larger than 10 x 6 of any form are to be brought into the examination room.**
3. **No books, notes or other study material are to be brought into the examination room.**
4. **During the Examination there is to be no communication between or amongst students for any purpose. All questions must be directed to and channeled through the faculty member conducting the examination.**
5. **Only the scrap paper provided by the proctor is to be used for the examination. Scrap paper should bear the code number assigned to each student, and be handed over to the proctor along with the examination.**
6. **Students are not expected to leave the examination room before completing their examination and turning it in to the proctor.**
7. **NO FOOD OR SMOKING is permitted in the examination room.**
8. **It is the student's responsibility to remove any coffee or water containers taken into the examination room.**
9. **NO CELL PHONES ARE ALLOWED.**
10. **EXAMINATION RESULTS WILL ONLY BE GIVEN TO STUDENTS WHO ARE REGISTERED.**

CODE NUMBER_____

STUDENTS: PLEASE CIRCLE ONLY THE QUESTIONS ANSWERED AND PROVIDE THE PAGE NUMBERS.

QUESTIONS	PAGE NUMBERS
1.	
2.	
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1. There is only one firm that produces test solutions, Answer-All. Answer-All faces a linear demand function given by P=320-4Q and has a MC=40.
   a. How many test solutions and what price will Answer –All charge for them?
   b. Teachers seeing the profit that Answer-All is making decide to form a company called Teach-Cheat. Teach-Cheat and Answer-All now are the only companies that provide test solutions. The market demand is ($P=320-4(Q_{AA}+Q_{TC})$). Answer-All still has MC=40, however Teach-Cheat has a cost advantage with MC=0 (Teachers make the test so they have the answers!). Graph Answer-All and Teach-Cheat reaction (best response) functions. Show output levels for Counrot, Monopoly, and Perfect Competition for each firm. (Hint: The reaction curves are not symmetric.)
   c. Competing in Cournot duopoly fashion, which firm will make the most profit? Explain why? (Hint: You do not have to solve for the profit to answer this question.)

2. There are 200 price taking pharmaceutical firms selling a "miracle pill" that is supposed to make people more attractive. The cost function for each firm is $C(q) = q^2 + 20q + 100$. The market demand is $Q^D = 5000 - 40p$.
   a. Derive the market supply function $Q^S(p)$.
   b. What would be the short run equilibrium price and quantity?
   c. What would be the long run equilibrium price and quantity? How many firms will operate on the market?
   d. Suppose now that "Miracle pill" company obtains an exclusive patent on producing and selling "miracle pill". How much will the monopolist produce and charge for each pill?

3. Duality
   Let $u(x,y)=(x+2)y$. Find the following
   a. the Marshallian demand functions for x and y
   b. the indirect utility function
   c. the compensated (Hicksian) demand functions for x and y
   d. the expendeiture function
   e. Use your answers to a and d to derive the Hicksian demand functions for x and y. Compare these to your answers to c. Explain what you are doing.
   f. Use your answers to b and c to derive the Marshallian demand functions. Compare these to your answers for a. Explain what you are doing.
   g. Write the Slutsky equation for this problem.

4. In a firm, when the capital is fixed at $\overline{K}$ in the short run, the labor demand is given by $L(Q) = Q^2/K$, and the short-run cost is given by $STC(Q; \overline{K}) = Q^2/K + 100\ \overline{K}$
   a. Compute and plot short -run average and marginal cost functions.
   b. Find the capital demand K and labor demand L of the firm in the long-run.
   c. Compute its long-run cost function TC(Q).
   d. Show the relationship between short-run and long-run total cost curves by drawing $STC(Q; \overline{K})$ and TC(Q) on the same graph.

5. Consider the program below: The government subsidizes your wages by paying you 50% in addition to what your employer paid you but the subsidy applies only to the first $80 (per day) you receive from your employer. If you earn more than $80 per day, the government gives you only the subsidy for the first $80 earned but nothing for anything additional you earn. For instance, if you earn $100 per day, the government would give you 50% of the first $80 you earned — or $40.

   Suppose you consider workers 1 and 2. Both can work up to 10 hours per day at a wage of $10 per hour, and after the policy is put in place you observe that worker 1 works 7 hours per day while worker 2 works 5 hours per day. Assume throughout that leisure is a normal good.
   a. Draw the workers budget constraint before and after the policy is put in effect.
   b. Explain how worker 1 will changes her consumption of leisure and work after the policy.
   c. Explain how worker 2 will changes her consumption of leisure and work after the policy.

   For the sake of argument, assume that leisure is a Giffen good
   d. What is a Giffen good?
   e. How do your answers to parts b. and c. change.

6. The Phillie Phanatic always eats his ballpark franks in a special way- 1 foot-long hot dog together with precisely 1 bun, 1 oz. of mustard, and 2 oz. of pickle relish. His utility is a function only of these four items and any extra amounts of a single item without the other constituents is worthless.

    a. What form does PP's utility function for these four goods have?
    b. How might we simplify matters by considering PP's utility to be a function of only one good? What is that good?
    c. Suppose foot-long hot dogs cost $1, buns cost $.50, mustard costs $.05 per oz, and pickle relish costs $.1 5 per oz. How much does the good defined in part b cost?
    d. If the price of foot-long hot dog increases by 50 percent (to $1.50) what is the percentage increase in the price of the good?
    e. How would a 50% increase in the price of the bun affect the price of the good? Why is the answer different from part d?
    f. If the government wanted to raise $1 in taxes by taxing the goods that PP buys, how should it spread this tax over the four goods so as to minimize the utility cost to PP?

7. Suppose that you are able to consume only two goods, coffee and donuts. Use a graphical and written analysis to answer the following questions.
    a. Draw your budget constraint for coffee and donuts. Please put donuts per week on the y-axis and cups of coffee per week on the x-axis. Label all axes. Illustrate the optimal bundle E.
    b. Suppose you learn that coffee will prolong your life. Illustrate this new information on the budget constraint in your graph. Identify the new equilibrium bundle E'.
    c. Do you now drink more or less coffee than before the new information? Why?
    d. Are you better off, worse off, or as well off at the new equilibrium as the old? How can you be sure of your answer?

8. The Washington Metropolitan Area Transit Authority (WMATA) is considering raising fares. You are the Chief Economist for WMATA and they want your opinion on some issues. Please answer each of the following questions.
    a. WMATA has done some research and determined that if the price goes from $3.00 to $5.00, then ridership will fall from 20,000 to 18,000 hourly. What is the price elasticity of demand for metro riding on the hourly basis?
    b. Is it elastic or inelastic?
    c. Would the total spending on metro increase or decrease due to the change in price? Explain.
    d. WMATA thinks that metro trips are a normal good. During the economic downturn, which saw average income go from $50,000 to $40,000, metro ridership was unchanged at 20,000 hourly. Is WMATA correct that metro trips are a normal good? Explain.
    e. WMATA outsourced some research to a consulting firm. The consulting firm reported “The cross price elasticity between gasoline and metro trips is negative if a person lives in DC, while zero if they live in the suburbs.” Are these results reasonable? Explain.