**HOWARD UNIVERSITY**

**DEPARTMENT OF ECONOMICS**

**CODE NUMBER\_\_\_\_\_\_\_\_ TOTAL NUMBER OF PAGES\_\_\_\_\_\_\_**

**DATE\_\_\_\_\_\_\_\_\_\_\_\_**

**COMPREHENSIVE EXAMINATION: Spring 2018 Microeconomics Theory MA**

**EXAMINERS:**

1. **Dr. Omari H. Swinton, Chairperson**
2. **Dr.**  **Alex Henke**
3. **Dr. Zhun Xu**
4. **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.**

1. **YOU ARE REQUIRED TO ANSWER ONLY FIVE (5) QUESTIONS.**

**Any additional questions answered over the required number from each category will NOT receive credit.**

1. **Correct answers to questions NOT asked will receive NO credit.**
2. **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.**
3. **Begin each question on a new page. Number each page used in sequence. Write only on one side of the paper.**
4. **Write clearly and illustrate your answers with graphs whenever and wherever possible.**
5. **USE ONLY BLACK INK PENS.**
6. **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.**

**Revised 09/07/2004**

**CODE NUMBER\_\_\_\_\_\_\_\_\_\_\_**

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

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| **QUESTIONS** | **PAGE NUMBERS** |
| **1.** |  |
| **2.** |  |
| **3.** |  |
| **4.** |  |
| **5.** |  |
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| **8.** |  |

**1.** Suppose the quantity demanded is given by qd=90-p and a monopolist's marginal cost is given by MC=q.

1. What is the monopolist's marginal revenue curve?
2. What is the monopolist's profit maximizing quantity of production? What is the optimal price for him to charge? Assuming the monopolist has no fixed costs, what is his maximum profit?
3. Assuming the monopolist is maximizing his profits, what is consumer surplus (in dollars)?
4. What is the socially optimal (or efficient) level of production (the level for perfect competition)? What would total surplus be at that level (in dollars)?
5. What is the dead weight loss from the existence of a monopoly in this market (in dollars)?

2. Suppose you have $400,000 to spend on a house and "other goods." The price of 1 square foot of housing is $100 and you choose to purchase your optimally sized house at 2000 square feet.

1. Call this house A. **After** you bought the house the price of housing falls to $50 per square foot. Given that you can sell house A if you want to, are you now better off or worse off? Call the new house you would buy given your new budget set house B. (Illustrate your answer on a graph showing your budget set before you bought the house as well as the budget set after you bought house A and the price fell. Put "square feet of housing" on the horizontal axis and "$ of other consumption" on the vertical axis.) Is house B smaller than house A? Does your answer depend on whether the good is normal, regular inferior or Giffen?
2. Suppose that the price had fallen before you purchased the original house. Call the house you would have bought house C. Is house C larger than house B? Larger than house A? Does your answer depend on whether housing is normal, inferior or Giffen? Carefully justify your answer.
3. Evaluate whether the following sentence is true or false: "If moving and selling costs are zero, then, once a consumer has bought a house, he/she will be happy regardless of whether the price of housing rises or falls after he/she bought the house."

3. Suppose a consumer's direct utility function is: U = x11/3x21/3

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1. Derive the expenditure function, and the indirect utility function.
2. Let p2 = 4, and income $100. Suppose that p1 rises from $1 to $4. What is the initial utility level – you can transform it first, but state so and give the new one? What is the final utility level after the price change?
3. Suppose the consumer demands compensation for the price increase. How much is the compensation if
   * 1. the consumer gets compensation to purchase the original consumption levels after the price increase
     2. the consumer is not to be harmed by the price increase?
4. What is the least costly policy to restore the consumer to their original level of satisfaction:
   * 1. an income supplement,
     2. a price subsidy for good 1 of $,
     3. an in-kind free-to-the-consumer provision of units of good 1?

4. Two neighbors have decided to share a garden. Now each neighbor has to decide how much effort to put towards the garden. Individual effort, ei exist between [0,1]. The payoff to each neighbor from sharing the garden depends on the effort each player puts forth. The fruits of their labor are given by fi(ei,ej)=160 ei ej

1. In one graph draw the two neighbors’ best response functions when the cost of effort is ci(ei)=40ei?
2. What is/are the equilibrium level of effort?
3. In one graph draw the two neighbors’ best response functions when the cost of effort is ci(ei)=40\*ei 2?
4. What is/are the equilibrium level of effort?

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 $60 (per day) you receive from your employer. If you earn more than $60 per day, the government gives you only the subsidy for the first $60 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 $60 you earned — or $30.

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.

1. Draw the workers budget constraint before and after the policy is put in effect.
2. Explain how worker 1 will changes her consumption of leisure and work after the policy.
3. 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

1. What is a Giffen good?
2. 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.

1. What form does PP's utility function for these four goods have?
2. How might we simplify matters by considering PP's utility to be a function of only one good? What is that good?
3. 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?
4. 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?
5. How would a 50% increase in the price of the bun a\_ect the price of the good? Why is the answer different from part d?
6. 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. Consider the following functions. Show that each of those has a diminishing MRS, but that they exhibit constant, increasing, and decreasing marginal utility, respectively.

1. U(x; y) = xy
2. U(x; y) = x2y2
3. U(x; y) = ln(x) + ln(y)

8. Consider a firm with production function

q = 1000*l*1/2 *k*1/2

Suppose that the monthly rental rate on capital is v = 12000 per machine and the monthly wage rate for labor is w = 3000 per worker.

1. What is the formula for the marginal rate of technical substitution in this case?
2. How much capital and labor would the firm hire and what would its costs be if it planned to produce:
   * 1. q = 4; 000 units
     2. q = 10; 000 units
     3. q = 20; 000 units
3. Sketch the cost function in a graph with dollars on the vertical axis and output on the horizontal.
4. What are its long-run average and marginal cost functions, AC(q) and MC(q)? Sketch these functions in a second graph (below your \_rst graph) with dollars per unit of output on the vertical axis and output on the horizontal axis.

Suppose for the rest of the question that the firm's capital stock is fixed at k0 = 5 machines in the short run.

1. How much labor would the firm hire and what would its total cost be if it produced:
   * 1. q = 4; 000 units
     2. q = 10; 000 units
     3. q = 20; 000 units
2. What are the firm's short-run total, fixed, and variable cost functions, SC (q), FC, and V C(q)? Sketch the short-run total cost function in the same graph as the long-run cost function.
3. What are its short-run average total, average variable, and marginal cost functions, SAC(q), AV C(q), and SMC(q)? Sketch these three functions in the same graph as long-run average and marginal costs.