

**Econ 100B – Spring 2009**  
**Midterm Exam - Version 1**  
**May 5, 2009**

*Instructions: Write your name, perm #, TA, and Version # on your Scantron sheet. There are 20 multiple-choice questions on this exam. Answer as many questions as possible in the time allowed. No calculators are allowed. I do not expect everyone to be able to answer all 20 questions. If you get stuck on something, I strongly suggest moving on and coming back later if/when you have time. Good luck!*

1) Neumann has a block of uranium worth \$1000, but with probability one-third, half the block will decay into worthless lead, leaving him with only \$500 of uranium. If the price of insurance is  $p = .5$ , what is Neumann's state-contingent budget constraint? (Let  $c_d$  and  $c_{nd}$  be Neumann's respective wealth if the uranium decays and doesn't decay, respectively.)

- a.  $c_{nd} = 1250 - .5c_d$
- b.  $c_{nd} = 1500 - c_d$
- c.  $c_{nd} = 1250 - 2c_d$
- d.  $c_{nd} = 1500 - .5c_d$
- e.  $c_{nd} = 750 - 2c_d$

ANS: B,  $c_{nd} = 1500 - c_d$

2) If Neumann's utility of money is given by  $U(x) = \ln(x)$ , what is his utility-maximizing condition? (math hint: the derivative of  $\ln(x)$  with respect to  $x$  is  $1/x$ .)

- a.  $c_{nd} = c_d$
- b.  $c_{nd} = .5c_d$
- c.  $c_{nd} = 2c_d$
- d.  $c_{nd} = c_d/3$
- e.  $c_{nd} = 3c_d$

ANS: C,  $c_{nd} = 2c_d$

3) Nacho has a demand function for burritos that is given by the equation  $q(p) = 10 - .5p$ . If the price of burritos is \$6, how much is Nacho's gross consumer surplus and net consumer's surplus, respectively?

- a. \$70 and \$49
- b. \$91 and \$42
- c. \$91 and \$49
- d. \$100 and \$42
- e. \$100 and \$49

ANS: C, \$91 and \$49

- 4) Claudia's preferences can be represented by the utility function,  $U(x,y) = \min\{x,y\}$ . She currently has an income of \$20 and faces prices (\$1, \$1). If the price of good x increases by \$2 and the price of y remains the same, then the compensating variation:
- equals the equivalent variation
  - is \$10 smaller than the equivalent variation
  - is \$10 greater than the equivalent variation
  - is \$20 greater than the equivalent variation
  - none of the above

ANS: C, is \$10 greater than the equivalent variation

- 5) Kylie's utility function for cell phones and money is given by the utility function,  $U(x,y) = 9,000x + y$ , where x is the number of cell phones she has and y is the amount of money she has. Her income is \$21,000. Her reservation price for one cell phone is
- \$9,000 - y
  - \$9,000
  - \$12,000 - p
  - \$12,000
  - \$21,000

ANS: B, \$9,000

- 6) Suppose that demand for a good is given by  $q = 100 - 10p$ , where q is quantity demanded and p is price. Which of the following is true?
- Demand is constant-elastic.
  - Demand is elastic at prices above 5, and inelastic at prices below 5.
  - Demand is inelastic at prices above 5, and elastic at prices below 5.
  - Demand is elastic at prices above 10, and inelastic at prices below 10.
  - Demand is inelastic at prices above 10, and elastic at prices below 10.

ANS: b, Demand is elastic at prices above 5, and inelastic at prices below 5.

- 7) A firm faces the demand curve  $q = 30p^{-1/2}$ , where q is quantity demanded and p is price. Which of the following is true?
- Setting the price to 15 maximizes the firm's revenue.
  - Setting the price to approximately 6.082 maximizes the firm's revenue.
  - The firm can set any price greater than zero, and its revenue will be the same.
  - The firm can always increase revenue by increasing its price, so there is no finite revenue-maximizing price.
  - The firm can always increase revenue by decreasing its price, so the revenue-maximizing price is arbitrarily close to zero.

ANS: d, The firm can always increase revenue by increasing its price, so there is no finite revenue-maximizing price.

8) There are two potential buyers in the market, Stan and Tony. Stan has the demand function  $Q_S = \max\{10 - p, 0\}$  and Tony has the demand function  $Q_T = \max\{2 - p/5, 0\}$ . What is the price that maximizes revenue?

- a. 1
- b. 2.22
- c. 3
- d. 5
- e. 10

ANS: d

9) A certain kingdom features a competitive market for rye bread. The inverse demand for rye bread is  $p = 10 - (q/10)$  and the supply function is  $q = 10 + 5p$ , where  $p$  is the price in dollars and  $q$  is loaves of bread. What is the equilibrium price and quantity?

- a)  $(p,q) = (6,50)$
- b)  $(p,q) = (7,30)$
- c)  $(p,q) = (4,30)$
- d)  $(p,q) = (5,50)$
- e)  $(p,q) = (6,40)$

ANS: E,  $(p,q) = (6,40)$

10) The king made it illegal to sell rye bread for a price above 5 dollars per loaf. To avoid shortages, he agreed to pay bakers enough of a subsidy for each loaf of bread so as to make supply equal demand. How much would the subsidy per loaf have to be?

- a) 8 dollars
- b) 4 dollars
- c) 10 dollars
- d) 5 dollars
- e) 3 dollars

ANS: e, 3 dollars

11) The inverse demand function for apples is defined by the equation  $p = 200 - 5q$ , where  $q$  is the number of units sold. The inverse supply function is defined by  $p = 10 + 4q$ . A tax of \$10 is imposed on suppliers for each unit of apples that they sell. When the tax is imposed, the quantity of apples sold falls to

- a) 20 apples
- b) 25 apples
- c) 28 apples
- d) 30 apples
- e) 15 apples

ANS: A, 20 apples

12) A 10 dollar per unit tax is imposed on waffle makers, which lowers the quantity produced from 87 to 79 and increases the price buyers pay from 19 dollars to 25. The deadweight loss of this tax is

- a) 40 dollars
- b) 48 dollars
- c) 24 dollars
- d) 80 dollars
- e) 60 dollars

ANS: A, 40 dollars

13) The demand function for abalone is  $q = 40 - 5p$  and the supply function is  $q = 15p$ . Suddenly the yuppies discover abalone. The quantity demanded at every price doubles. The supply function, however, remains the same as before. What is the effect on the equilibrium price and quantity?

- a) The price doubles and quantity remains constant
- b) Both price and quantity double
- c) Both price and quantity increase but neither doubles
- d) The quantity doubles and the price remains constant
- e) None of the above

ANS: C, Both price and quantity increase but neither doubles

14) A profit-maximizing monopolist faces a constant marginal cost of \$1 per unit. If at the price he is charging, the price elasticity of demand for the monopolist's output is  $-5/4$ , then

- A. He must be charging a price of \$5 per unit
- B. He must be charging a price less than \$5 per unit
- C. He must be charging a price more than \$5 per unit
- D. There is not enough information to determine the price.

ANS: A

15) Suppose FM has a monopoly on the domestic car market and faces inverse demand given by  $P(y) = 4 - y$  and total costs given by  $C(y) = y^2$ . Prices and costs are in terms of dollars. What price should FM charge?

- A. \$1
- B. \$3
- C. \$2
- D. \$5
- E. \$4

ANS: B

16) Suppose that the government imposes a new tax on FM (from the previous question). It now has to pay the government \$2 per unit of output. FM's optimal response will be to

- A. increase the price by \$0.50
- B. increase the price by \$1.00
- C. increase the price by \$1.50
- D. decrease the price by \$0.50
- E. decrease the price by \$1.00

ANS: A, increase the price by \$0.50

17) Now suppose that FM's marginal and fixed costs are both zero. As noted above, the inverse demand in the domestic market for its cars is  $P_d(y_d) = 4 - y_d$ . FM also sells in the foreign market and faces inverse demand  $P_f(y_f) = 6 - y_f/3$ . What would FM's profits be if it engaged in multimarket (3<sup>rd</sup> degree) price discrimination?

- A. \$27
- B. \$4
- C. \$31
- D. \$35
- E. \$62

ANS: C, \$31

18) What would FM's profits be if it could engage in perfect (first degree) price discrimination in both markets?

- A. \$62
- B. \$54
- C. \$8
- D. \$31
- E. \$35

ANS: A, \$62