

Name: _____

Student Number: _____

MIDTERM EXAMINATION I ECO 2144 B:

Thursday, October 7th, 2010

Instructions:

Each multiple choice question is worth **1 mark**. Marks for the short answer questions are indicated at the end of the questions. Total marks = **35**.

For the multiple choice questions, please circle the correct answer in the test paper. If you need to change your answer, very clearly cross out your previous answer and circle and arrow to the correct answer. If the distinction between your old and new answers is not clear, no marks will be awarded.

Short answer problems should be answered in the space provided. Be sure to show all your work. Diagrams should be clearly labeled and explained.

This exam consists of **10** pages (2 blank) and **17** questions.

You have **1 hour and 15 minutes** to complete the exam.

No aids (including calculators!) are permitted.

Good luck.

1. Identifying the appropriate way to allocate an economy's resources is an example of
 - a) a constrained optimization problem.
 - b) a comparative statics problem.
 - c) an equilibrium analysis.
 - d) marginal analysis.

2. Which of the following statements regarding exogenous and endogenous variables is correct?
- a) Exogenous variables, because they are determined outside the model, tend to be mostly irrelevant to the model's solution.
 - b) Endogenous variables will always be determined within the model.
 - c) Exogenous variables, because they are variable, typically change within the model as endogenous variables change.
 - d) The values for the endogenous variables are impossible to predict since we can never be certain of the values for the exogenous variables.
3. Which of the following statements about positive analysis is correct?
- a) Positive analysis prescribes the best solution to an economic problem.
 - b) Positive analysis predicts how an economic system will change over time.
 - c) While normative analysis can be wrong, since it is often based on someone's opinion, positive analysis is always accurate.
 - d) Since positive analysis is based on a model, and not the real world, it is mostly irrelevant.
4. Which of the following statements best illustrates the law of supply?
- a) When the price of flour rises, the supply of bread falls.
 - b) When the price of steel falls, the supply of automobiles rises.
 - c) When the price of crayons rises, the quantity supplied of crayons rises.
 - d) When the price of televisions rises, the quantity supplied of televisions falls.
5. Suppose that the market for newspaper is initially in equilibrium. Further suppose that there is both an increase in the price of ink and a decrease in the price of magazines. Which of the following accurately describes the new equilibrium?
- a) The equilibrium price will rise; the equilibrium quantity is ambiguous.
 - b) The equilibrium price is ambiguous; the equilibrium quantity will fall.
 - c) The equilibrium price will fall; the equilibrium quantity is ambiguous.
 - d) The equilibrium price is ambiguous; the equilibrium quantity will rise.

6. If demand is elastic, an increase in price
- will increase total revenue
 - will decrease total revenue
 - will have an indeterminate effect on total revenue
 - will decrease total profit
7. When a linear demand curve can be expressed as $Q = a - bP$, which region corresponds to the elastic portion of the demand curve?
- Price ranges from $\frac{a}{b}$ to $\frac{a}{2b}$.
 - Price ranges from $\frac{a}{2b}$ to 0.
 - Quantity ranges from $\frac{a}{2}$ to a.
 - Only where quantity equals $\frac{a}{2}$.
8. Consider the demand curve $Q^d = 200P^{-1}$. The elasticity of demand along this demand curve
- is inelastic
 - is elastic
 - is unitary elastic
 - falls as the price falls
9. Which of the following statements is false?
- Marginal utility may be negative.
 - Marginal utility is the slope of total utility.
 - If the more is better assumption is satisfied, total utility will increase as consumption increases.
 - If the more is better assumption is satisfied, the marginal utility from consuming the second unit must be greater than the marginal utility from consuming the first unit.
10. The principle of diminishing marginal utility implies
- indifference curves are concave.
 - indifference curves are convex.
 - indifference curves are straight lines.
 - as your consumption level increases, the marginal utility received from consumption of an additional unit increases.

11. Suppose the price of good x is \$2 and the price of good y is \$3. Also, suppose $MU_x = y$ and $MU_y = x$. Which of the following baskets could be an interior optimum?
- a) $x = 10, y = 15$
 - b) $x = 7.5, y = 5$**
 - c) $x = 2, y = 4$
 - d) $x = 6, y = 8$
12. Identify the statement that is false.
- a) An increase in the amount of income changes the intercepts of the budget constraint but not the slope.
 - b) An increase in the price of good x changes both the x -intercept and the slope of the budget constraint.
 - c) An increase in the price of good x and an equal percentage increase in the price of good y changes the x -intercept, the y -intercept, and the slope of the budget constraint.**
 - d) An increase in the price of good x and an increase in the price of good y may or may not change the slope of the budget constraint.
13. If the government would like to induce a consumer to consume a specific level of some good
- a) a cash subsidy system would likely be cheaper for the government than a voucher system.
 - b) a voucher system would likely be cheaper for the government than a cash subsidy system.**
 - c) the government should only use a cash subsidy system since this always make consumers better off.
 - d) the government should only use a voucher system since this always makes consumers better off.
14. Suppose John is planning to join a book club. Membership in the club will allow John to purchase books for half price. Normally books cost \$10. If John has an income of \$200, the club membership fee is \$50, and we plot the number of books purchased on the horizontal axis and a composite “other goods” which have a price of \$1 on the vertical axis, the slope of John’s budget line after joining the club will be
- a) -10
 - b) -5**
 - c) -2
 - d) -1

Short Answer Problems: Please show all your work. Diagrams should be clearly labeled and explained.

15. Suppose the demand curve is $Q_d = 600 - 2P$

a) At what price will demand be unitary elastic? **(3 marks)**

$$\begin{aligned} \epsilon_p &= \frac{dQ}{dP} \times \frac{P}{Q} \\ -1 &= -2x \frac{P}{600 - 2P} \\ P^* &= \frac{600}{4} \\ &= 150 \end{aligned}$$

16. For the following utility function: $U(x, y) = x^2 + y^2$

a) Calculate the marginal utility of x (MU_x). **(1 mark)**

$$\begin{aligned} MU_x &= \frac{dU}{dx} \\ &= 2x \end{aligned}$$

b) Is MU_x increasing, decreasing or constant? Explain **(1 mark)**

MU_x is increasing because as x increases MU_x increases ($2x$ is an increasing function of x)

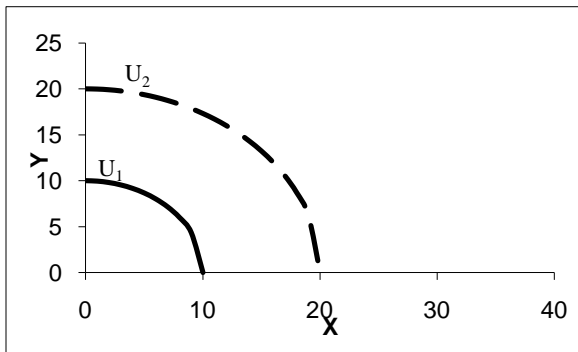
c) What is the $MRS_{x,y}$? **(2 marks)**

$$\begin{aligned} MRS_{x,y} &= \frac{MU_x}{MU_y} \\ &= \frac{2X}{2Y} \\ &= \frac{X}{Y} \end{aligned}$$

- d) Is $MRS_{x,y}$ diminishing, constant or increasing as the consumer substitutes x for y along an indifference curve? Explain (1 marks)

$MRS_{x,y}$ is increasing because as X increases MRS increases (X/Y is an increasing function of X)

- e) On a graph with x on the horizontal axis and y on the vertical axis, draw a typical indifference curve (it need not be to scale but it needs to reflect accurately whether there is a diminishing $MRS_{x,y}$). (2 marks)



- f) Will the indifference curve intersect either or both axes? Why, why not? (2 marks)

Since it is possible to have $U > 0$ if either $x = 0$ (and $y > 0$) or $y = 0$ (and $x > 0$), the indifference curves intersect both axes.

17. Previously, gasoline was less expensive in the United States than in Canada, but now gasoline costs less in Canada than in the United States. Consider the consumer who lives equally close to gas stations in both countries:

- a) Describe (or graph) the indifference curves of the consumer for Canadian and American gasoline and provide an equation. (3 marks)

Presumably the consumer views the American gasoline and the Canadian gasoline as PERFECT SUBSTITUTES, so the indifference curves look like straight lines with a slope of -1 .

- b) On a separate graph, draw the initial budget line where prices are relatively low in the United States, and show the optimum. **(3 marks)**

The consumer picks the highest budget line that touches the budget constraint – the optimum will be a corner solution where the consumer buys only the cheaper American gasoline.

If Canadian gasoline is put on the horizontal axis – it needs to be clear that the slope of the budget line is **STEEPER** than the indifference curves (because P_c/P_a – the slope of the budget line – will be greater than 1 if the price of American gas (P_a) < the price of Canadian gas (P_c)). Recall the slope of the indifference curve is -1 as the 2 goods are perfect substitutes

- c) On another graph, draw the new budget line where prices are relatively low in Canada and show the new optimum. **(3 marks)**

The consumer picks the highest budget line that touches the budget constraint – the optimum will be a corner solution where the consumer buys only the cheaper Canadian gasoline.

If Canadian gasoline is put on the horizontal axis – it needs to be clear that the slope of the budget line is **FLATTER** than the indifference curves (because P_c/P_a – the slope of the budget line – will be less than 1 if the price of American gas (P_a) > the price of Canadian gas (P_c)).