Faculté des sciences sociales | Faculty of Social Sciences

uOttawa

Département de science économique
Department of Economics

Name: _____ **Student Number:** _____

MIDTERM EXAMINATION I
ECO 2144 B:

Thursday, October 3rd, 2013

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. Society faces trade-offs because of

a) government regulations.
b) greedy corporations.
c) faceless bureaucrats.
d) scarcity.

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. Consider the demand function Qd = 150 - 2P. The effects of other determinants of Qd is reflected in

a) the intercept of the function.
b) the slope of the function.
c) neither the slope nor the intercept of the function.
d) in both the slope and the intercept of the function.

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. When a linear demand curve can be expressed as $Q = a - bP$, which region corresponds to the elastic portion of the demand curve?

a) Price ranges from a/b to $a/2b$.
b) Price ranges from $a/2b$ to 0.
c) Quantity ranges from $a/2$ to a.
d) Only where quantity equals $a/2$.

7. If the demand curve for comic books is expressed as Q = 10,000/p, then demand has a unitary elasticity

a) only when p = 10,000.
b) only when p = 100.
c) always.
d) never.

8. Which of the following is most likely to be true?

a) Income elasticity of demand for fur coats exceeds that of oatmeal.
b) Income elasticity of demand for oatmeal exceeds that of fur coats.
c) Income elasticity of demand for fur coats equals that of oatmeal.
d) It is not possible to make any prediction about relative income elasticities.

9. Suppose the demand curve for a good is downward sloping and the supply curve is upward sloping. At the market equilibrium, if demand is more elastic than supply in absolute value, a $1 specific tax will

a) raise the price to consumers by 50 cents.
b) raise the price to consumers by less than 50 cents.
c) raise the price to consumers by more than 50 cents.
d) raise the price to consumers by $1.

10. Which of the following statements is false?

a) Marginal utility may be negative.
b) Marginal utility is the slope of total utility.
c) If the more is better assumption is satisfied, total utility will increase as consumption increases.
d) 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.

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. If Johnny likes homework (H) but hates exercise (E), which of the following might best represent his utility function for homework and exercise?

a) $U = H + E$
b) $U = H/E$
c) $U = H^2 + \sqrt{E}$
d) $U = H^2 \times \sqrt{E}$

13. 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

True/False/Uncertain

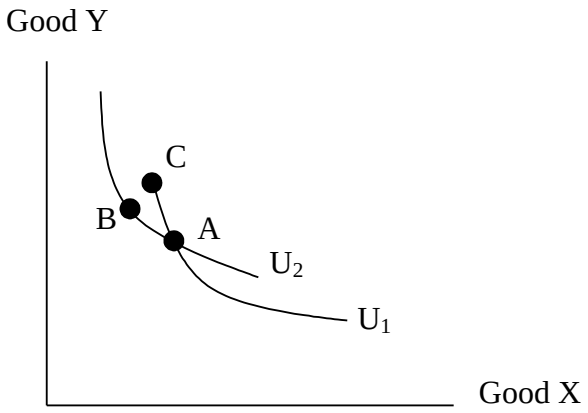
Answer the following with True/False/Uncertain and justify your answer. Marks are only given for the explanations. **(4 marks each)**

14. If a linear supply curve has a zero intercept, the elasticity of supply is always unitary.

True. A linear supply curve from the origin takes the form $Q = ap$. Elasticity equals $a * p/Q$. Substituting for Q yields $a * p/ap$. Numerator and denominator cancel and the elasticity equals one at every price.

15. Indifference curves corresponding to two different levels of utility can never cross.

FALSE, indifference curves can never cross. For example, suppose we draw indifference curves for two levels of utility U_1 and U_2 with $U_2 > U_1$. In addition, suppose that these indifference curves crossed at some point A as in the following diagram.



Because A and B are on U_2, both achieve the same level of utility. Since A and C are on U_1, both achieve the same level of utility. Transitivity implies that the consumer would be indifferent between b and c; however, since more is preferred to less, c is preferred to b. Thus as a result of the assumption of **transitivity** and the assumption that more is preferred to less, indifference curves cannot intersect.

Short Answer Questions. Please be sure to show and explain your work

16. Nicholas' utility function is U=2B+Z

    a. This utility function suggests that Nicholas views good B and good Z as: _____Perfect Substitutes_____. **(1 mark)**

b. On a well labeled graph with good B on the horizontal axis and Z on the vertical axis, please draw the indifference curves for U = 4 and U = 8. **(2 marks)**

Graph:

4 = 2B + Z and 8 = 2B+Z

c. Do the indifference curves demonstrate decreasing $MRS_{B,Z}$? Explain. **(2 marks)**

Note that $MRS_{B,Z}$ = slope of the indifference curves
= - ratio of the marginal utilities
$= -\frac{U_B}{U_Z}$
=-2/1
=-2
As shown above the indifference curves are straight lines will constant slope of -2.

The MRS is constant, not decreasing.

d. Describe Nicholas' optimal bundle in terms of the relative prices of B and Z (p_B and p_z) **(4 marks)**

In the case of linear indifference curves (with constant MRS as here) the tangency condition is unlikely to hold. The optimal solution is thus a corner solution (the individual consumes all of one good and none of the other).

To know which corner will be chosen (which good will be consumed) we compare the Bang for the Buck for each good:

Good x is chosen if the bang for the buck for good B is greater than the bang for the buck for good Z.

Choose all of good B if:

$$\frac{U_B}{p_B} > \frac{U_Z}{p_z}$$

Subbing in $U_B = 2$ and $U_Z = 1$ and cross-multiplying:

Consume all of good B if

$$\frac{p_Z}{p_B} > \frac{1}{2}$$

Similarly

Consume all of good Z if

$$\frac{p_Z}{p_B} < \frac{1}{2}$$

17. Suppose Paul's utility depends on the amount of time spent playing on the Internet (*x*) and the amount of time playing video games (*y*), and his utility function is

$U(x,y) = 2xy^2$

He has 15 hours of free time to spend on these two activities each week, and his goal is to maximize his utility.

a) Write out the constrained optimization problem. Be sure to clearly indicate the objective function and the constraint. (HINT: while this problem does not have a budget constraint, the constraint is linear and can be treated in the same way as a budget constraint we have used in class) **(2 marks)**

$$\max_{x,y} xy^2 \; subject\ to\ x + y = 15$$

Note xy^2 is the objective function and $x+y=15$ is the constraint.

b) Solve for the optimal amount of time spent surfing the Internet and playing video games each week. **(4 marks)**

The optimal (x,y) will satisfy:

The constraint: x+y=15 (1)

and the tangency condition: MRS = MRT

$$\frac{U_X}{U_y} = \frac{1}{1}$$

$$\frac{2y^2}{4xy} = 1$$

$y=2x$ (2)

Substitute equation (2) into (1) and solve for x* = 5, y*=10