
Midterm 1

You have until 11:50am to complete this exam. Be certain to put your name, id number and section on both the exam and your scantron sheet and fill in test form A on the scantron. Answer all multiple choice questions on your scantron sheet. Choose the single best answer for each question; if you fill in multiple answers for a question you will be marked wrong. Answer the long answer questions directly on the exam. You must show your work for full credit. Answers may be left as fractions. Please place a box around final answers when appropriate. Good luck!

Name:

ID Number:

Section:

SECTION I: MULTIPLE CHOICE (60 points)

- Which of the following pairs of utility functions would represent the same preferences?
 - $U(x, y) = 2xy$ and $V(x, y) = xy$.
 - $U(x, y) = x^2y^2$ and $V(x, y) = xy$.
 - Neither (a) nor (b).
 - Both (a) and (b).
- In which of the following cases would the demand curve for good x and the Engel curve for good x have the same sign?
 - When good x is a normal, ordinary good.
 - When good x is an inferior, Giffen good.
 - When good x is an inferior, ordinary good.
 - Both (b) and (c).
- Suppose that every extra cookie increases Abe's utility by four units. Which of the following must be true?
 - Abe's marginal utility of cookies is zero.
 - Abe's marginal utility of cookies is increasing.
 - Abe's marginal utility of cookies is diminishing.
 - Abe's marginal utility of cookies is positive.
- Betty is indifferent between eating 2 apples and 6 oranges and eating 6 apples and 2 oranges. Betty prefers eating 4 apples and 4 oranges to eating 2 apples and 6 oranges. We can say for certain that:
 - Betty's preferences are not transitive.
 - Betty's preferences are not convex.
 - Betty's preferences are not monotonic.
 - (a) and (b).

5. At his current bundle, Calvin's marginal utility from pretzels is 2 and his marginal utility from cans of soda is 4. What is the largest number of pretzels Calvin would be willing to trade for one more can of soda?
 - (a) 1.
 - (b) 2.
 - (c) 4.
 - (d) 8.
6. Suppose that coffee and sugar are complements. The slope of the price offer curve when the price of coffee is varied will be:
 - (a) Positive.
 - (b) Negative.
 - (c) Zero.
 - (d) It depends on which good is on the horizontal axis.
7. Dotty is currently spending all of her money on shirts and jackets and these are the only two goods she consumes. At her current bundle, a dollar spent on shirts would increase utility more than a dollar spent on jackets. At this current bundle on a graph with shirts on the horizontal axis:
 - (a) The indifference curve is steeper than the budget line.
 - (b) The indifference curve is flatter than the budget line.
 - (c) The indifference curve is tangent to the budget line.
 - (d) There is no indifference curve passing through the bundle.
8. On a graph with pencils on the horizontal axis and erasers on the vertical axis, the greater the price of pencils is:
 - (a) The steeper the indifference curves will be.
 - (b) The flatter the indifference curves will be.
 - (c) The steeper the budget line will be.
 - (d) The flatter the budget line will be.
9. Eugene likes salt and pepper and always consumes them in equal quantities. An increase in the price of pepper will lead to (you can assume Eugene spends all of his income on salt and pepper):
 - (a) An increase in the quantity of pepper consumed and a decrease in the quantity of salt consumed.
 - (b) An increase in the quantity of salt consumed and a decrease in the quantity of pepper consumed.
 - (c) An increase in both the quantity of salt consumed and the quantity of pepper consumed.
 - (d) A decrease in both the quantity of salt consumed and the quantity of pepper consumed.
10. Suppose that when graphing utility as a function of good x , with good x on the horizontal axis, we get a downward sloping curve. Then we know that:
 - (a) The marginal utility of x is diminishing.
 - (b) The marginal utility of x is positive.
 - (c) x is a bad.
 - (d) The marginal utility of x is constant.

11. The demand for jelly beans (J) in terms of the price of jelly beans (p_J), the price of chocolates (p_C) and income (I) is given by the following demand function:

$$J(p_J, p_C, I) = \frac{I}{2p_J + 5p_C}$$

Which of the following is true?

- (a) Jelly beans are an ordinary good, jelly beans and chocolates are substitutes.
 - (b) Jelly beans are a normal good, jelly beans and chocolates are complements.
 - (c) Jelly beans are an inferior good, jelly beans and chocolates are substitutes.
 - (d) Jelly beans are a Giffen good, jelly beans and chocolates are complements.
12. If two bundles lie on the same indifference curve, which of the following is definitely true?
- (a) Both bundle cost the same amount.
 - (b) The bundles may lie on different indifference curves if prices change.
 - (c) The more expensive of the two bundles will give the consumer greater utility.
 - (d) The utility level of each bundle is the same.
13. If good x and good y are the only two goods a person consumes, doubling the prices of both goods and doubling income will:
- (a) Make the set of affordable bundles larger.
 - (b) Make the set of affordable bundles smaller.
 - (c) Leave the set of affordable bundles unchanged.
 - (d) Change the consumer's optimal bundle.
14. Suppose Francine considers both spiders and roaches to be bads. On a graph with spiders on the horizontal axis and roaches on the vertical axis:
- (a) Francine's indifference curves will have a positive slope.
 - (b) Francine's indifference curves will have a negative slope.
 - (c) Francine's utility will be increasing as the number of spiders and roaches increases.
 - (d) Francine's utility will be decreasing as the number of spiders and roaches decreases.
15. Suppose that at George's optimal bundle, he buys positive quantities of both books and DVDs, the slope of the indifference curve is equal to -1 and he spends all of his income on books and DVDs. Which of the following must be true?
- (a) The price of a book is equal to the price of a CD.
 - (b) The quantity of books he buys is equal to the quantity of CDs he buys.
 - (c) Both (a) and (b).
 - (d) Neither (a) nor (b).

SECTION II: SHORT ANSWER (40 points)

1. (16 points) Harriet's utility from board games (B) and toys (T) is given by the following utility function:

$$U(B, T) = B^{\frac{1}{2}} + 4T^{\frac{1}{2}}$$

- (a) Derive expressions for the marginal utility of board games and for the marginal utility of toys.
- (b) Derive an expression for the optimal number of board games in terms of the price of board games (p_B), the price of toys (p_T) and Harriet's income (I).

2. (12 points) Isaac buys music albums both in the form of CDs and as digital downloads. His utility from albums on CD (C) and digital albums (D) is given by:

$$U(C, D) = 8C + 10D$$

- (a) Suppose that Isaac is offered a choice between one free CD or one free digital album. Which will he take? Explain your answer. (Your explanation should only require one or two sentences.)
- (b) The price of a CD is \$5 and the price of a digital album is \$6 and Isaac's income is \$30. Draw two graphs, one showing the Engel curve for CDs and one showing the Engel curve for digital albums. Be certain to clearly label slopes and intercepts with their values and to label the axes.

3. (12 points) For each scenario below, draw the graph that the question asks for, labeling as much as you can.
- (a) Suppose that apples and bananas are the only two goods a person buys. Initially the price of an apple is \$2, the price of a banana is \$4 and the person's income is I . Then the price of apples goes up to \$4 and the person's income doubles. On a graph with apples on the horizontal axis and bananas on the vertical axis, show both the original budget line and the new budget line.
 - (b) Suppose apples and bananas are both normal, ordinary goods and are substitutes. On a graph with apples on the horizontal axis and bananas on the vertical axis, show three points on the price offer curve obtained by changing the price of apples. Be certain to show the budget line and indifference curve corresponding to each point.