

Homework: C-P, C-D and D-W

Select the best choice from the possible answers given:

1. For students who attend public colleges, the average opportunity cost of foregone wages is:
 - A) less than the cost of college tuition
 - B) more than the cost of college tuition
 - C) equal to the cost of college tuition
2. The info provided in the lecture provides the following assessment of Bill Gates' decision to drop out of Harvard
 - A) This was a wise decision for Bill Gates because the opportunity cost of attending college exceeded the long-term benefit of attending college. His opportunity cost was high because of his unusual entrepreneurial skill.
 - B) This would probably be a wise decision for most people; statistics show that our society places too much emphasis on education.
 - C) This was an unwise decision. Bill Gates could have started Microsoft after he graduated from college.
 - D) None of the above
3. Which of the following is NOT an assumption that we make about consumer preferences?
 - A) Completeness.
 - B) Downward-sloping.
 - C) Non-satiation.
 - D) Transitivity.
4. Why can't indifference curves be upward-sloping?
 - A) It makes it impossible to calculate marginal utility.
 - B) It's a violation of the completeness principle.
 - C) It's a violation of the non-satiation principle.
 - D) All of these.
5. How is marginal utility defined?
 - A) The derivative of utility with respect to the number of goods consumed.
 - B) The total utility gained from consuming a bundle of goods.
 - C) The utility gained from consuming only one good.
 - D) The utility gained from consuming the first unit of a given good.
6. For most people, how does the marginal rate of substitution change as you move along a non-linear indifference curve?
 - A) It declines.
 - B) It depends on the specific shape of the indifference curve.
 - C) It increases.
 - D) It stays the same.

7. What is an appropriate intuitive explanation of the principle of diminishing marginal utility?
 - A) Consumers have a preference for diversity in consumption.
 - B) Consumers value more the first unit of any good they own, compared to the hundredth unit.
 - C) Everyone gets tired of consuming the same thing eventually.
 - D) All of these.
8. What happens to a consumer when the price of a good she consumes increases, or her income decreases?
 - A) She is better off if a good's price increases, but worse off if her income decreases.
 - B) She is unambiguously better off.
 - C) She is unambiguously worse off.
 - D) She may be better off or worse off, depending on her preferences.
9. How do we graphically represent the utility maximizing bundle that consumers can afford?
 - A) A point on the indifference curve that is to the right of the budget constraint.
 - B) The point at which the indifference curve and the budget constraint cross.
 - C) The point of tangency between an indifference curve and the budget constraint.
 - D) The point where the budget constraint crosses the X or Y axis.
10. You are consuming two goods, pizzas and movies. At your current bundle, the marginal utility you would gain from spending an extra dollar on pizza is higher than the marginal utility you would gain from spending an extra dollar on movies. What should you do?
 - A) Don't change your purchases; you are already consuming the optimal bundle.
 - B) It depends on how much income you have.
 - C) Purchase more movies.
 - D) Purchase more pizza.
11. What is the definition of a corner solution?
 - A) An optimal bundle of two consumer goods in which only one type of good is consumed.
 - B) An optimal bundle of two consumer goods in which the consumer does not spend all of his/her income.
 - C) An optimal bundle of two consumer goods in which the same amount of each good is consumed.
 - D) None of these.
12. What is the definition of the income elasticity of demand?
 - A) The percentage change in quantity demanded for a given percentage change in income.
 - B) The percentage change in quantity demanded for a given percentage change in price.
 - C) The percentage change in quantity demanded for a given percentage change in the price of the other good.
 - D) The percentage change in quantity supplied for a given percentage change in income.
13. In order to analyze the total effect of a change in price on the total consumption of a good, we decompose it into two components. What are the names of these two components?
 - A) The substitution effect and the income effect.
 - B) The substitution effect and the inferior effect.
 - C) The substitution effect and the normal effect.

14. What is a plausible example of a good with negative income elasticity (i.e., an inferior good?)
- A) Jewelry.
 - B) Rice.
 - C) Sports cars.
 - D) Steak.
15. Assume you are consuming two goods, and the price of one increases. However, you are given extra income to ensure that your utility does not decrease. What happens to your consumption of the good with the higher price?
- A) It decreases.
 - B) It increases.
 - C) It may increase or decrease.
 - D) It stays the same.
16. What is a Giffen good?
- A) A good where consumption falls when the price increases.
 - B) A good where consumption increases when the price increases.
 - C) A good where consumption rises when income falls.
 - D) A good where consumption rises when income rises.
17. When we model the consumers trade-off between consumption and leisure, what is the slope of the budget constraint?
- A) The price of the consumers favorite good.
 - B) The ratio of prices between two goods the consumer consumes the most.
 - C) The ratio of the wage rate to the price of the consumers favorite good.
 - D) The wage rate.
18. If the income effect dominates the substitution effect in the labor supply decision, what happens when the wage increases?
- A) It depends on their specific preferences.
 - B) Workers work less.
 - C) Workers work more.
 - D) Workers work the same amount.
19. If rural households in Vietnam begin to earn more money for their crops and become richer, what will happen to the supply curve for their children's labor? (**Hint:** assume that education is a normal good.)
- A) It depends on their preferences.
 - B) It will shift left.
 - C) It will shift right.
 - D) No change.
20. Mary is willing to give up 3 cups of soup to obtain 5 slices of bread, regardless of the particular bundle of soup and bread that she now has. For Mary,
- A) Bread and soup are complements.
 - B) Bread and soup are perfect substitutes.

- C) You can't tell whether bread and soup are complements or substitutes.
D) None of the above.
21. Describe the relationship between a price-consumption curve and a demand curve:
A) The price-consumption curve shows the impact of price changes on the purchase of both goods, while the demand curve only shows the impact of a price change on the purchases of that one good.
B) The axes for the price-consumption graph are the quantities of the two goods, while the axes for the demand graph are price and quantity of one good
C) Answer (A) is correct, but (B) is not
D) Both (A) and (B) are correct
22. Fred buys sneakers and cardigan sweaters with his budget. In a graph with sneakers measured on the vertical axis and cardigans measured on the horizontal axis, which statement is true?
A) An increase in the price of cardigan sweaters will make the budget line less steep.
B) An increase in the price of cardigan sweaters will increase the vertical intercept and decrease the horizontal intercept of the budget line.
C) A decrease in Fred's budget will shift the entire budget line inward toward the origin, and make it steeper.
D) A decrease in the price of sneakers will increase the slope of the budget line.
E) An increase in Fred's relative preference for cardigans will cause his budget line to become steeper.
23. Margaret buys cakes (C) and loaves of bread (B). Here utility function is given by $U(C,B) = B^3C^2$. The price of cakes, P_C , is \$12 and the price of bread, P_B , is \$6. Margaret's money income, M is \$60. What combination of cakes and bread would she buy?
A) $C = 4, B = 3$
B) $C = 3, B = 4$
C) $C = 4, B = 2$
D) $C = 1, B = 8$
E) $C = 2, B = 6$
24. Which statement is true regarding compensated and uncompensated price changes?
I. A compensated price change consists of a price change and an income change which, together, leave the consumer's well-being unaffected.
II. An uncompensated price change consists of a price change with no change in income.
III. For normal goods, compensated and uncompensated price changes are identical.
IV. For inferior goods, compensated and uncompensated price changes are identical.
A) I only is correct
B) II only is correct
C) I and III are correct
D) I and II are correct
E) II and IV are correct
25. Consumer surplus is
A) the area between the demand curve and the line that represents price – and between the quantity zero and the quantity purchased by the consumer.

- B) the consumer's total net benefit.
 - C) both a and b
 - D) none of the above
26. Hausman estimated consumer surplus from cell phones
- A) by estimating the demand curve and then computing the area between that demand curve and the price line.
 - B) and concluded that the federal regulation (that delayed the introduction of cell phones) helped consumers by increasing the magnitude of consumer surplus.
 - C) both a and b
 - D) none of the above

Answer the following questions:

27. You need to repair your car. An hour of repair time costs \$100 and you have a budget of \$1,000. The total benefit of H_E hours of engine work is $B_E(H_E) = 500H_E - 30(H_E)^2$ and the total benefit of H_B hours of body work is $B_B(H_B) = 500H_B - 20(H_B)^2$. How many hours of engine work should you get, and how many hours of body work?
28. In each of the following examples, a consumer purchases just two goods: x and y . Based on the information in each of the following parts, sketch a plausible set of indifference curves (that is, draw at least two curves on a set of labeled axes, and indicate the direction of higher utility). Also, write down a utility function $u(x,y)$ consistent with your graph. Note that although all these preferences should be assumed to be complete and transitive (as required for utility representation), not all will be monotone.
- A) Jessica enjoys bagels x and coffee y , and consuming more of one makes consuming the other more enjoyable.
 - B) Plamen loves mocha swirl ice cream x , but he hates mushrooms y .
 - C) Jennifer likes Coca-Cola x , and neither likes nor dislikes Wang-Lao-Ji y .
 - D) Edward always buys three white tank tops x for every pair of jeans y .
 - E) Nancy likes both peanut butter x and jelly y , and always gets the same additional satisfaction from an ounce of peanut butter as she does from two ounces of jelly.
29. It is exactly 24 hours before Han Meimei's physics final. She has an economics final directly after the physics final and has no time to study in between. Han Meimei wants to be a physicist, so she places more weight on her physics test score. Her utility function is given by
- $$u(p, e) = 0.6 \ln(p) + 0.4 \ln(e)$$
- where p is the score on the physics final and e is the score on the economics final. Although she cares more about physics, she is better at economics; for each hour spent studying economics she will increase her score by 3 points, but her physics score will only increase by 2 points for every hour spent studying physics. Studying zero hours results in a score of zero on both subjects (although $\ln(0)$ is not defined, assume her utility for a score of zero is negative infinity).
- A) What constraints does Han Meimei face in her test score maximization problem?
 - B) How many hours should Han Meimei optimally spend studying physics? How many hours studying economics? (hours are divisible)
 - C) What economics and physics test scores will she achieve (i.e. what are e^* and p^*)?

- D) What utility level will she achieve?
- E) Suppose Han Meimei can get an economics tutor. If she goes to the tutor, she will increase her economics test score by 5 points for every hour spent studying instead of 3 points, but will lose 4 hours of study time by going to the tutor. She cannot study while at the tutor, and going to the tutor does not directly improve her test score. Should Han Meimei go to the tutor?
30. Suppose there are two consumers (Albie and Bubbie) who demand strawberries. Suppose that Albie's demand for strawberries is given by
- $$q_a(p) = p^a f_a(I_a)$$
- and Bubbie's demand is given by
- $$q_b(p) = p^b f_b(I_b)$$
- where I_a and I_b are Albie and Bubbie's incomes, and $f_a(\cdot)$ and $f_b(\cdot)$ are two functions.
- A) Find Albie and Bubbie's (own-price) elasticities of demand, $\epsilon_{q_a,p}$ and $\epsilon_{q_b,p}$.
- B) Suppose that $a > 0 > b$. Are strawberries a Giffen good for Albie? Are strawberries a Giffen good for Bubbie?
- C) Are strawberries an inferior good for Albie? Are strawberries an inferior good for Bubbie? Assume that these demands arise from utility maximization, given linear budget constraints.
Hint: This question should not require much/any algebra beyond (b).
31. Joe considers beer and soda to be perfect substitutes at a rate of 1:2, that is, he always receives the same utility if he has one beer or two sodas to drink. He spends \$12 a day on drinks, and beers cost \$3 while sodas cost \$1 each. However, one day the price of beers decreases to \$2; there is no change in his budget. Answer the following questions **without** using algebra!
- A) How does consumption change when the price of beers changes and explain why? What is Joe's new level of utility?
- B) Use a graph to show what happens to the optimal allocation and the level of utility when the price of beer changes.
- C) How much must Joe's budget decrease to return him to the original utility level?
- D) Now assume the price of beers returns to the original price of \$3. Use a graph to describe the demand curve for soda holding the price of beer and income constant.
32. Han Meimei spends all her income on statistical software (S) and clothes (C). Her preferences can be represented by the utility function: $U(S,C) = 4\ln(S) + 6\ln(C)$.
- A) Compute the marginal rate of substitution of software for clothes. Is the MRS increasing or decreasing in S? How to interpret this?
- B) Find Han Meimei's demand functions for software and clothes, $Q_s(p_s, p_c, I)$ and $Q_c(p_s, p_c, I)$, in terms of the price of software (p_s), the price of clothes (p_c), and her income (I).
- C) Draw the Engel curve for software.
- D) Suppose that the price of software is $p_s = 2$, the price of clothes is $p_c = 3$, and Han Meimei's income is $I = 10$. What bundle of software and clothes (S, C) maximizes Han Meimei's utility?
- E) Suppose the price of software increases to $p_s = 4$. What bundle of software and clothes does Han Meimei demand now?

- F) Given the price increase, how much income does Han Meimei need to remain as happy (have the same utility) as she was before the price change? What bundle of software and clothes would Han Meimei consume if she had that additional income, given the new prices?
- G) Going back to the situation in part (e) ($p_s = 4$ and $I = 10$), decompose the total change of software and clothes demanded into substitution and income effects. In a clearly-labeled diagram with software on the horizontal axis, show the income and substitution effects of the increase in the price of software.
33. Bob lives in San Diego, California. The firms in town, such as the Walmart, pay teenagers without a high school degree the federal minimum wage of \$7.25 an hour. Because his parents provide him Y^* (mostly in the form of room), Bob chooses to stay in school and not work. However, a new fracking firm starts production nearby so the wage rises to three times the minimum wage. Use a labor-leisure choice figure to show why Bob does not work initially but then works a substantial number of hours at the higher wage.