Econ 103: Principles of Microeconomics
Quiz III (Version a), 21 March 2016

Name (Family) ___________________________
Student # ___________________________

Part A: Choose the best answer for the following 18 questions. Make only one choice for each question (1 mark)

1. A consumption point inside the budget line
   A). is not possible to attain.
   B). is possible to attain but has some unspent income.
   C). shows that the consumer has chosen to spend all of his or her income on both products.
   D). shows that the consumer spends income on only one of the goods.

2. Which of the following statements is correct?
   A). Consumers have the ability to buy everything they desire.
   B). A consumer’s budget line shows the limits to what a consumer can buy.
   C). A consumer’s budget line shows the goods with the highest marginal utilities.
   D). Rich consumers are unaffected by prices.

3. Which of the following statements is correct?
   A). The slope of the budget line is an opportunity cost.
   B). Along the budget line, consuming more of one good implies consuming more of the other.
   C). The slope of the budget line shows there is no tradeoff between the two goods because the consumer can buy each of them.
   D). All of the above answers are correct.

4. A budget line
   A). shows the limits to what can be consumed.
   B). has a slope equal to an opportunity cost.
   C). has a slope equal to a relative price.
   D). All of the above answers are correct.

5. Reb earns $1,000 per week as a fishing guide in Texas. With this money he buys fishing lures and steaks. Lures cost $5 each, steaks cost $10 each. If Reb purchases 124 lures per week, how many steaks can he buy?
   A). 620
   B). 38
   C). 123
   D). 380

6. If the price of a good that a consumer purchases decreases, the consumer’s budget line will
   A). rotate outward and its slope will change.
   B). rotate inward and its slope will change.
   C). shift outward and its slope will not change.
   D). shift inward and its slope will not change.

7. Reb buys fishing lures and steaks. If the price of a fishing lure decreases, the maximum number of fishing lures he can purchase increases and the maximum number of steaks he can purchase...
   A). increases; increases
   B). increases; decreases
   C). increases; does not change
(8) If you consume hot dogs and hamburgers and your budget increases, while the prices of hot dogs and hamburgers do not change, then your budget line
A). does not change.
B). shifts outward and its slope does not change.
C). rotates outward and its slope changes.
D). shifts inward and its slope does not change.

(9) If the total utility of 2 bags of chips is 20, the total utility of 3 bags is 30, and the total utility of 4 bags is 38 units, then the marginal utility of the 3rd and 4th bags are
A). 8 and 7, respectively.
B). 12.5 and 11, respectively.
C). 11 and 10, respectively.
D). 10 and 8, respectively.

<table>
<thead>
<tr>
<th>Candy bars</th>
<th>Bags of potato chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>Total utility</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>10 &gt; 6</td>
</tr>
<tr>
<td>2</td>
<td>16 &gt; 2</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
</tbody>
</table>

Use the above table to answer questions 10 and 11.

(10) Liz consumes two goods, candy bars and potato chips. Her budget is $4 per day. The price of a candy bar is $1.00 and the price of a bag of chips is 50 cents. Her utility is in the table above. How much marginal utility per dollar spent does the 3rd bag of potato chips give Liz?
A). 18
B). 4
C). 8
D). We need more information to be able to answer the question.

(11) For Liz to maximize her utility, what combination of candy bars and potato chips should she eat?
A). 4 candy bars and 0 bags of potato chips
B). 3 candy bars and 2 bags of potato chips
C). 2 candy bars and 4 bags of potato chips
D). 1 candy bar and 5 bags of potato chips

(12) The demand curve for macadamia nuts is downward sloping. This slope is because consumers maximize their utility and an increase in the price of macadamia nuts leads to
A). no change in quantity demanded.
B). an increase in the marginal utility per dollar spent on macadamia nuts.
C). a decrease in the marginal utility per dollar spent on macadamia nuts.
D). an outward rotation of consumers' budget lines.

(13) Juan’s marginal utility from strawberries is 200 and his marginal utility from cream is 100. Juan spends all his budget. The price of strawberries is $5 per pound and the price of cream is $5 per pint. To maximize his utility, Juan should
A). buy more cream and fewer strawberries.
B). buy less cream and more strawberries.
C. buy more cream and more strawberries.
D. do nothing because Juan is maximizing his utility now.

14. The fact that diamonds have a much higher price than water
   A). violates the rules of utility maximization because water is necessary for life.
   B). does not violate the rules of utility maximization because globally, fresh water is actually very rare.
   C). does not violate the rules of utility maximization because water's marginal utility is low.
   D). violates the rules of utility maximization because diamonds are not necessities.

15. Billy has a $20 budget to spend on yogurt and cereal. Yogurt costs $2 each and cereal costs $4 each. Which of the following could be a utility-maximizing combination of yogurt and cereal?
   A). 4 yogurts and 4 cereals.
   B). 10 yogurts and 5 cereals.
   C). 3 cereals and 5 yogurts.
   D). 4 cereals and 2 yogurts.

16. Billy has a $20 budget to spend on yogurt and cereal. Yogurt costs $2 each and cereal costs $4 each. Suppose that the quantity of yogurt is on the vertical axis and the quantity of cereal is on the horizontal axis. If the price of yogurt increases, which of the following is true?
   i) The budget line rotates outward.
   ii) Yogurt’s marginal utility per dollar decreases.
   iii) The relative price of yogurt increases.
   A). i and ii
   B). i and iii
   C). ii and iii
   D). i, ii, and iii.

17. Billy has a $20 budget to spend on yogurt and cereal. Yogurt costs $2 each and cereal costs $4 each. Suppose that the quantity of yogurt is on the vertical axis and the quantity of cereal is on the horizontal axis. The budget line’s vertical intercept equals ___.
   A). $10
   B). 5 yogurts
   C). 10 yogurts
   D). None of the above answers is correct.

18. Part of what is required for a consumer to maximize utility is for the consumer to
   A). allocate the entire available budget.
   B). makes the marginal utility per dollar spent as much different as possible for all goods.
   C). make the marginal utility per dollar spent as small as possible for all goods.
   D). spends as little money as possible.
Part B: Answer all questions. Must Show all work at the space provided, otherwise, no mark will be given. (29 marks)

1. Maximizing Total Utility: Sara has $46 and she has to allocate the money between steak and orange juice. The price of steak is $10 and the price of orange juice is $4. (24 marks)

<table>
<thead>
<tr>
<th>Steak</th>
<th>Orange Juice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>TU</td>
</tr>
<tr>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>180</td>
</tr>
<tr>
<td>3</td>
<td>240</td>
</tr>
<tr>
<td>4</td>
<td>280</td>
</tr>
</tbody>
</table>

(a). Fill in the table. (16 marks)

(b). What combination of the two goods would Sara consume to maximize her TU? Explain. (6 marks)

(i). \[
\frac{MU_s}{P_s} = \frac{MU_{oj}}{P_{oj}} = 6
\]

(ii). \[10(3) + 4(4) = 46\]

(c). What is the TU for this combination? (2 marks)

\[TU = 240 + 144 = 384\]
2. Indicate whether the following statement is true, false or uncertain. Explain. (5 marks)

"The principle of diminishing marginal utility means that as consumption of a good increases, total utility decreases but at an increasing rate."

F: Diminishing Mill

- as Q ↑ ⇒ TU ↑, but MUI ↓

⇒ TU ↑ at a decreasing rate

since MUI = slope of TU.
Consider the income and substitution effects of price changes. If the price of a normal good changes, the income effect of the price change will
A). reinforce the substitution effect.
B). always be to increase quantity demanded.
C). oppose the substitution effect.
D). always be larger than the substitution effect.

Suppose a consumer can purchase only two goods, soap and apples. If the price of soap falls and the consumption of apples increases, we can conclude that the increased consumption of apples is due to
A). the income effect only.
B). the substitution effect only.
C). both the income effect and the substitution effect.
D). neither the income effect nor the substitution effect.

Suppose there are only two goods, A and B, and that consumer income is constant. If the price of good A falls and the consumption of good B rises, we can conclude that
A). B is a normal good.
B). B is an inferior good.
C). A is a normal good.
D). A is an inferior good.

A demand curve for a normal good is downward sloping due to
A). the income effect.
B). the substitution effect.
C). neither the substitution effect nor the income effect.
D). the combination of income and substitution effects.

Suppose the price of potatoes falls and we observe a decrease in an individual's purchases of potatoes. Which of the following can we infer?
A). The income effect just offsets the substitution effect.
B). The substitution effect outweighs the income effect.
C). The income effect is negative and reinforces the substitution effect.
D). The income effect is negative and outweighs the substitution effect.

The substitution effect of a price change
A). will result in the consumer buying less of a good at a higher price.
B). will result in the consumer buying less of a good at a lower price.
C). is less than the income effect for normal goods.
D). is equal to the income effect for normal goods.

As a consumer moves along an indifference curve
A). the combination of goods he prefers will remain constant, but the level of satisfaction will vary.
B). the combination of goods will vary but the level of utility remains constant.
C). the combination of goods will vary, but the level of money income remains constant.
D). his level of utility will vary as the combinations of goods varies.

8. If money income is reduced by half, and the prices of all goods consumed by the household are reduced by half, the household's budget line will
A). not change.
B). become steeper.
C). shift inward.
D). become flatter.

The diagram below shows a set of budget lines facing a household.

![Diagram showing budget lines](image)

9. Refer to Figure 6-8. The movement of the budget line from ab to ac could be caused by
A). an increase in the price of housing.
B). a decrease in the price of food.
C). a decrease in the price of housing.
D). an increase in money income.

10. Refer to Figure 6-8. The movement of the budget line from ab to db could be caused by
A) a decrease in the price of food.
B) a decrease in money income.
C) a decrease in the price of housing.
D) an increase in the price of housing.

11. Refer to Figure 6-8. The movement of the budget line from ab to ef could be caused by
A). a decrease in the price of either food or housing.
B). a decrease in money income.
C). an equal percentage decrease in the price of both food and housing.
D). an equal percentage increase in the price of both food and housing.

12. When a consumer's marginal rate of substitution between X and Y is equal to the ratio of prices for X and Y and when the consumer is spending all available income, then
A). all budget lines are tangent to all indifference curves.
B). the budget line is tangent to an indifference curve.
C) a higher indifference curve can be reached given the existing budget line.
D). the budget line is tangent to the indifference curve at all quantities of X and Y.

The figures below show Chris's consumption of specialty coffee per week.

![Graph showing Chris's consumption of specialty coffee per week.]

**FIGURE 6-10**

13. Refer to Figure 6-10. The two diagrams in Figure 6-10 are showing
   A). the derivation of Chris's demand curve for specialty coffee.
   B). that Chris is indifferent between bundles A, B and C. $C > B > A$
   C). the change in Chris's preferences toward specialty coffee. $\Delta p_c \Rightarrow B \land D \land C$
   D). the derivation of Chris's indifference curve for specialty coffee.

14. Refer to Figure 6-10. Suppose Chris's income is such that he is able to buy no more than 10 specialty coffees per week. If Chris is maximizing his utility at this level of income, how many specialty coffees is he consuming per week?
   A). 6
   B). 2
   C). 4
   D). 5

15. Refer to Figure 6-10. In general, the absolute value of the slope of the budget lines is equal to ________, which reflects the ________ of specialty coffees in terms of all other goods.
   A). $15/value of all other goods; opportunity cost
   B). the relative price ratio ($p_{all other goods}/p_{specialty coffee}$); demand
   C). the relative price ratio ($p_{specialty coffee}/p_{all other goods}$); opportunity cost
   D). the quantity of all other goods consumed divided by the quantity of specialty coffees consumed; quantity X and Y,
1. Utility: Let $U=2X^{1/2}Y^{1/2}$. $MU_x = Y^{1/2}X^{-1/2}$, $MU_y = X^{1/2}Y^{-1/2}$, $P_x=8$, $P_y=2$ and $I=80$ (33 marks)

(a). Find the equation for MRS. (2 marks)

$$\frac{MRS}{MRS} = \frac{MU_x}{MU_y} = \frac{Y^{1/2}}{X^{-1/2}} = \frac{X^{1/2}}{Y^{1/2}} = \frac{Y}{X}$$

$$\therefore \quad \frac{MRS}{MRS} = \frac{Y}{X}$$

(b). Find the equation for the income consumption curve. (4 marks)

$$\frac{Y}{X} = \frac{8}{2}$$

$$Y = 4X$$

(c). Find equilibrium $X$, $Y$, and $U$. (4 marks)

(i). $U = 2X^{1/2}Y^{1/2}$

(ii). $BE: 8e = 8x + 2y$

(iii). $CC: \quad y = 4x$

$$8e = 8x + 2(4x) = 16x$$

$$x = 5$$

$$y = 2e$$

$$U = 2(5)^{1/2}(2e)^{1/2} = 2e$$
(d). What is the equilibrium level of MUx, MUy and MRS? Interpret your figures. (6 marks)

\[ U'U_x = \frac{X}{Y^2} = \frac{(20)^{\frac{1}{2}}}{(5)^{\frac{1}{2}}} = 2 \]

i.e. 5th \text{X} \uparrow \text{ TU by 2.}

\[ U'U_y = \frac{Y}{X^2} = \frac{(5)^{\frac{1}{2}}}{(20)^{\frac{1}{2}}} = 0.5 \]

i.e. 20th \text{Y} \uparrow \text{ TU by 0.5}

\[ \frac{Y}{X} = \frac{20}{5} = 4 \]

i.e. willing to give up 4 \text{Y} for 1 more and being as happy as before.

Suppose Px decreases to $4.

3. Find the new equilibrium X', Y', and U'. (5 marks)

\[ \text{IIC} : \quad \frac{Y}{X} = \frac{M}{2} \]

\[ Y = 2X \]

\[ \text{new IIC in the new Bl} \]

\[ 8x = 4x + 2(2X) = 8x \]

\[ x' = 10 \]

\[ Y' = 20 \]

\[ U' = 2 (10)^{\frac{1}{2}} (20)^{\frac{1}{2}} = 28.28 \]
(f) Calculate the intermediate point X and Y? (4 marks)

(i) new IC: \( y = 2x \)

(ii) old IC: \( 2c = 2x^{\frac{1}{2}} y^{\frac{1}{2}} \)

\[ 2c = 2x^{\frac{1}{2}} (2x)^{\frac{1}{2}} \]

\[ X = \frac{2c}{2x^{\frac{1}{2}}} = 7.07 \]

\[ Y = 2(7.07) = 14.14 \]

(g) Calculate the SE and IE. Is X an inferior good? Explain. (4 marks)

\[ SE = 7.07 - 5 = 2.07 \]

\[ IE = 15 - 7.07 = 2.93 \]

Same direction \( \rightarrow \) normal good.

(h) Calculate the income needed to be at the intermediate point. What does this figure mean? (4 marks)

\[ I(E^2) = 4(7.07) + 2(14.14) = 56.56 \]

i.e. as Pd to \$4, needs only \$56.56

(or \$93.44 less) to be as happy as before.
2. Indicate whether the following statement is true, false or uncertain. Explain. (5 marks)

"Higher indifference curves represent higher levels of income."

= higher IC ⇒ higher TU,

o r higher Bi ⇒ higher income