



BIRZEIT UNIVERSITY

ECON 3311 - Intermediate Microeconomic

First Exam

98  
100

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Answer Sheet

1.	A	B	C	<del>D</del>	E
2.	A	B	C	<del>D</del>	E
3.	A	B	<del>C</del>	D	E
4.	A	B	<del>C</del>	D	E
5.	A	B	<del>C</del>	D	E
6.	A	B	<del>C</del>	D	E
7.	A	<del>X</del> B	C	<del>D</del>	E
8.	A	B	C	<del>D</del>	E
9.	A	B	C	<del>D</del>	E
10.	A	<del>B</del>	C	D	E
11.	A	<del>B</del>	C	D	E
12.	A	B	<del>C</del>	D	E
13.	A	B	C	<del>D</del>	E
14.	A	B	C	<del>D</del>	E
15.	<del>A</del>	B	C	D	E
16.	<del>A</del>	B	C	D	E
17.	A	B	C	<del>D</del>	E
18.	<del>A</del>	B	C	D	E
19.	A	<del>B</del>	C	D	E
20.	A	<del>B</del>	C	D	E

47.5

Section I: Multiple Choice (2.5 points each).

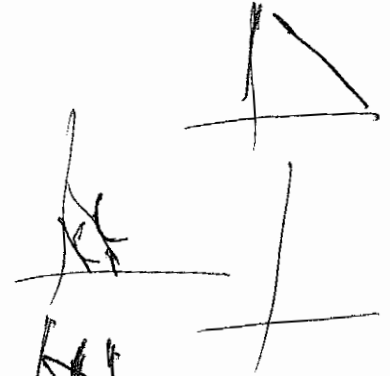
Please, circle the correct answer for each of the following 20 multiple-choice questions. For each question, only one of the answers is correct.

1. Suppose a consumer has \$100 to spend on two goods, shoes and shirts. If the price of a pair of shoes is \$20 per pair and the price of a shirt is \$15 each, which of the following combinations is unaffordable to the consumer?
- (A) 0 pairs of shoes and 0 shirts  
 (B) 2 pairs of shoes and 4 shirts  
 (C) 5 pairs of shoes and 0 shirts  
 (D) 0 pairs of shoes and 7 shirts

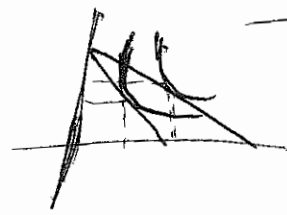
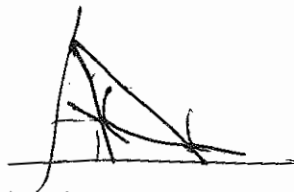
$100 \leq 20 \text{ Shoes} + 15 \text{ shirt}$

~~P1~~ P1

2. If the price-consumption curve of shelter is downward sloping, then
- (A) the amount of money spent on shelter increases as its price falls  
 (B) the amount of money spent on shelter decreases as its price falls  
 (C) the amount of money spent on shelter stays the same as its price falls  
 (D) it is impossible to tell whether the total expenditure on shelter has changed



3. The price elasticity of demand for durable goods tends to be
- (A) the same in the long-run and the short-run  
 (B) greater in the long-run than in the short-run  
 (C) greater in the short-run than in the long-run  
 (D) a nonnegative value (either positive or zero)



4. Suppose the price of A is \$20, the price of B is \$10, and that the consumer is currently spending all available income. At the consumer's current consumption basket the marginal utility of A is 6 and the marginal utility of B is 4.
- (A) the consumer is currently maximizing utility  
 (B) the consumer could increase utility by consuming more of good A and less of good B  
 (C) the consumer could increase utility by consuming more of good B and less of good A  
 (D) the consumer could increase utility by consuming more of both goods A and B

$\frac{6}{20} = \frac{4}{10} \rightarrow \frac{3}{10} \neq \frac{2}{5}$

5. Suppose that  $U(x,y) = \frac{1}{2}X + Y$ . Further suppose that  $P_x = \$4$  per unit and  $P_y = \$6$  per unit and income is  $I = \$36$ . For this consumer, the optimal basket (utility maximization) to buy would be
- (A)  $(x,y) = (9,0)$   
 (B)  $(x,y) = (6,0)$   
 (C)  $(x,y) = (0,6)$   
 (D)  $(x,y) = (3,0)$

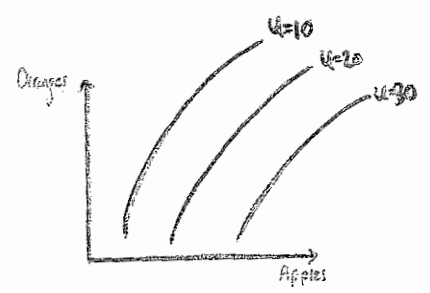
$36 \leq 4x + 6y \quad (1)$

X	Y	RU
0	6	6
9	0	3

$MU_x = \frac{1}{2}$   
 $MU_y = 1$

6. Giffen goods
- (A) are normal goods with a negative income effect  
 (B) are inferior goods with an income effect that is smaller in magnitude than the substitution effect  
 (C) are inferior goods with an income effect that is greater in magnitude than the substitution effect  
 (D) have downward sloping demand curve

7. Majed's preferences for Apples and Oranges are represent by the following indifference curves. Which of the following is true?
- (A) He likes both Apples and Oranges  
 (B) He likes Apples and dislikes Oranges  
 (C) He likes Oranges and dislikes Apples  
 (D) He dislikes both Apples and Oranges



8. Identify the statement that is False. Assume that <sup>PA</sup> the price of good x increases.
- (A) The substitution effect shows that the consumption of good x falls, regardless of whether x is a normal or inferior good.
- (B) The income effect shows that the consumption of good x rises if good x is an inferior good.
- (C) The overall effect shows that the consumer purchases more of good x if good x is a Giffen good.
- (D) The overall effect shows that the consumer purchases more of good x if good x is an inferior good.

9. Identify the truthfulness (مصداقية) of the following statements.

- I. along the linear demand curve the price elasticity of demand is constant F
- II. Demand tends to be more price inelastic when few substitutes for a product exist. T
- (A) Both I and II are true
- (B) Both I and II are false
- (C) I is true; II is false
- (D) I is false; II is true

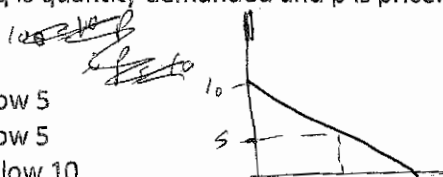
10. If Fared's marginal utility of pizza (horizontal axis) equals 10 and his marginal utility of salad equals 2, then

- (A) he would give up 5 pizzas to get the next salad
- (B) he would give up 5 salads to get the next pizza
- (C) he will eat five times as much pizza as salad
- (D) he will eat five times as much salad as pizza

$$MRS = \frac{MU_x}{MU_y} = \frac{10}{2} = 5 \rightarrow \#$$

11. Suppose that demand for a good is given by  $q = 100 - 10p$  where q is quantity demanded and p is price. Which of the following is true?

- (A) Demand is constant-elastic
- (B) Demand is elastic at prices above 5, and inelastic at prices below 5
- (C) Demand is inelastic at prices above 5, and elastic at prices below 5
- (D) Demand is elastic at prices above 10, and inelastic at prices below 10



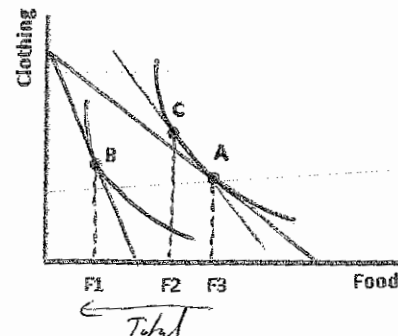
12. If food is an inferior good, then

- (A) its demand curve will be positively sloped
- (B) its income effect will be greater than its substitution effect
- (C) its Engel curve will be negatively sloped
- (D) All of the above

normal & inferior & Engel

13. A consumer's original utility maximizing market basket of goods is shown in the diagram below as point A. Following a price change, the consumer's utility maximizing market basket changes to point B. The substitution effect of the price change in food on the quantity of food purchased is:

- (A) the change from F2 to F1
- (B) the change from F1 to F2
- (C) the change from F3 to F1
- (D) the change from F3 to F2



14. We have asked Zain to rank his preferences between three market baskets, A, B, and C. If Zain prefers B to C but does not care (لا يهتم) if he gets A or B, then

- (A) A is on a higher indifference curve than B.
- (B) B is on a higher indifference curve than C but it is not possible to determine whether C is on a higher, lower, or the same indifference curve as A
- (C) B and C are on the same indifference curve.
- (D) Both A and B are on a higher indifference curve than C.

$$B > C$$

$$A = B$$

15. If the utility for two goods "x" and "y" is measured as  $U(X,Y) = 3x + y$ , then it can be concluded that

- (A) "x" and "y" are perfect substitutes
- (B) "x" and "y" are perfect complements
- (C) "x" and "y" are both bad
- (D) the indifference curves on the x,y graph will be upward sloping

16. Suppose demand is given by  $Q^d = 500 - 15P$  and  $Q^s = 5P$ . If the government imposes a \$15 price ceiling the excess demand will be

- (A) 200
- (B) 225
- (C) 250
- (D) 275

$Q_D = 295$

$Q_S = 75$

$500 - 15P > P$

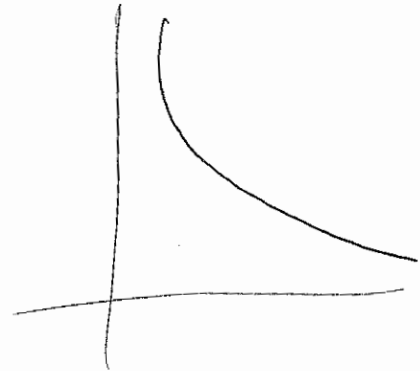
$500 > 20P$

$P = 25$

shortage

17. The principle that "More is better" results in indifference curves

- (A) Sloping down
- (B) Not intersecting
- (C) Reflecting greater preferences the further they are from the origin.
- (D) All of the above.



18. Which of the following demand equations is homogeneous?

- (A)  $Q = \frac{200I}{P_x + P_y}$
- (B)  $Q = \min\{3P_x, I\}$
- (C)  $Q = \frac{100}{(2P_x + I)}$
- (D)  $Q = 120 - 3P + 2I$

$= \frac{2(200I)}{2P_x + 2P_y}$

$\frac{2(100)}{2P_x + 2I}$

19. If  $P_x = P_y$  and it is not a corner solution, then when the consumer maximizes utility,

- (A) X must equal Y
- (B) MUX must equal MUY
- (C) X and Y must be substitutes
- (D) All of the above

$\frac{MUX}{P_x} = \frac{MUY}{P_y}$

$I = P_x X + P_y Y$   
 $I = P(X + Y)$

$Y + X = \frac{I}{P}$   
 $X = \frac{I}{P}$

20. Suppose demand is given by  $Q_d = 400 - 15P + 0.3I$ , where  $Q_d$  is quantity demanded,  $P$  is price and  $I$  is income. At  $P = 5$ , and  $I = 300$ , the income elasticity of demand is:

- (A) -0.18
- (B) 0.21
- (C) 0.3
- (D) 0.72

~~$E_i = \frac{P}{Q} \times \frac{dQ}{dI}$~~

$E_i = 0.3 \times \frac{I}{Q} = 0.3 \times \frac{300}{430}$

$Q = 400 - 60 + 90$

Section II: Essay Questions (50 points)

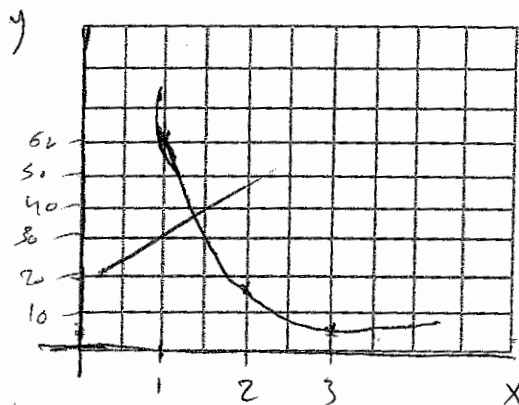
Question #1 (20 points) (show your work)

Consider the following utility function:  $U(X, y) = X^2 Y$

a. Graph the indifference curve  $U(X, Y) = 60$

$U(X, Y) = 60 \Rightarrow X^2 Y = 60 \Rightarrow Y = \frac{60}{X^2}$

X	Y
1	60
2	15
3	7



b. Find the formulas for the marginal utilities MUX and MUY.

$MUX = 2XY$

$MUY = X^2$

20

c. Find the MRS at the bundle  $(x=15, y=30)$

$MRS = \frac{MUX}{MUY} = \frac{2XY}{X^2} = \frac{2 \times 15 \times 30}{225} = \frac{900}{225} = 4$

d. What is the demand function (equation) for good X?

$I = P_x \cdot X + P_y \cdot y \quad (1)$

$\frac{MUX}{MUY} = \frac{P_x}{P_y} \Rightarrow \frac{2XY}{X^2} = \frac{P_x}{P_y} \Rightarrow \frac{2y}{X} = \frac{P_x}{P_y}$

$\Rightarrow X \cdot P_x = 2y \cdot P_y$   
 $\Rightarrow y \cdot P_y = \frac{X \cdot P_x}{2} \quad (2)$

$I = 2y \cdot P_y + X \cdot P_x \Rightarrow I = 3y \cdot P_y$

$I = P_x \cdot X + \frac{1}{2} X \cdot P_x \Rightarrow I = 1.5 X \cdot P_x$

$\Rightarrow X = \frac{I}{1.5 P_x}$

e. Based on their demand function how do you classify good X? Normal, inferior or Giffen good?

According to demand function of X  $\Rightarrow X = \frac{I}{1.5 P_x}$

There is positive relationship between  $Q_x$  of I

$\therefore X$  is a normal good

Question #2 (18 points) (show your work)

Shireen has a monthly income of \$912 that she allocates among two goods: Printers (P) and Ink cartridges (C). Suppose Printer cost \$90 per unit and Ink cartridges cost \$6 per unit. Suppose also that her utility function is given by the equation  $U(C, P) = \min(4P, C)$ .

a. What combination of Printers and Ink cartridges should she buy to maximize her utility?

~~912 = 90P + 6C~~ (1)

$C = 4P$  (2)

$912 = 90P + 6(4P) \Rightarrow 912 = 90P + 24P \Rightarrow 912 = 114P \Rightarrow P = \frac{912}{114} = 8$

$\therefore P = 8 / C = 4 \times 8 = 32$

$P = 8 / C = 32$  do max. utility.

18

b. If the price of Printer rises to \$128 per unit. What combination of Printers and Ink cartridges maximizes her utility?

$912 = 128P + 6C$  (1)

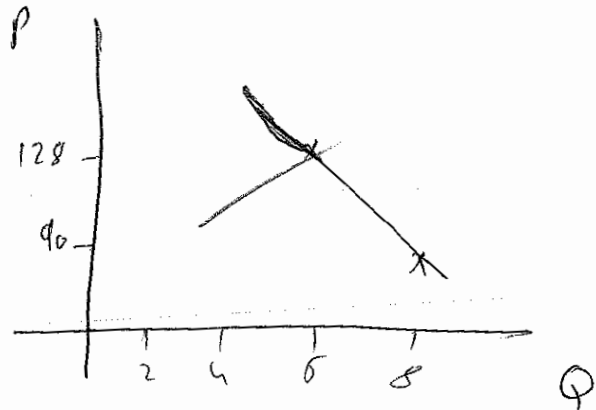
$C = 4P$  (2)

$\therefore 912 = 128P + 24P \Rightarrow 912 = 152P \Rightarrow P = 6$

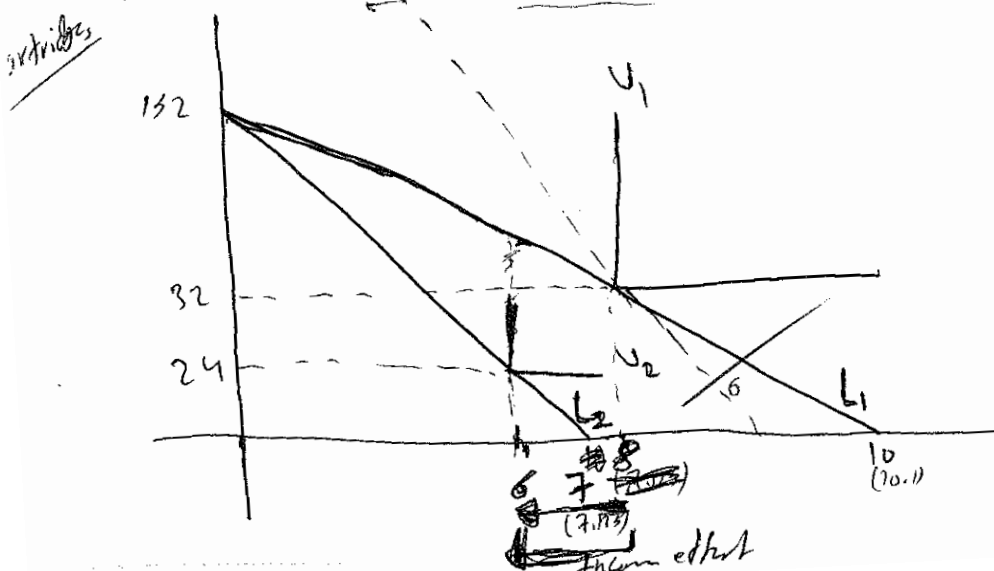
$P = 6 \Rightarrow C = 24$  do max utility.

c. Construct Shireen demand curve for printer.

Price	Qd of printer
90	8
128	6



d. Graphically show the income and substitution effects of the change in printer prices on printer.



$P_P \uparrow \rightarrow Q_{P,P} \downarrow$   
 $P_P \uparrow \rightarrow Q_{P,C} \downarrow$   
 (Complement)  
 P, C

because P, C are Complements  
 There is no substitution effect, so All the effect (Decrease) in  $Q_{P,P}$  as result of income effect

Printer effect

Question #2 (12 points) (show your work)

Consider the following demand function for DVD players:  $Q_D = 50 - 2P + 4P_A - 3P_B + 0.05I$ . Suppose the price of DVD players is \$40, the price of good A is \$45, the price of good B is \$20, and income is \$1,000 per month.

a. Are DVD players and good B (whose price is represented by  $P_B$ ) complements or substitutes? Explain

They are complements (because there is a negative relationship between them), when  $P_B$  ↑ by 1\$ then  $Q_D$  (DVDs) decreases by 3 units

b. Suppose that the supply function for DVD players is given by:  $Q_S - 2P = 20$ . What is the market equilibrium?

$$Q_S = 20 + 2P \quad (1) \quad Q_D = 50 - 2P + 4(45) - 3(20) + 0.05(1000)$$

$$= 50 - 2P + 180 - 60 + 50$$

$$\therefore Q_D = 220 - 2P \quad (2)$$

At equilibrium  $\Rightarrow Q_S = Q_D \Rightarrow 20 + 2P = 220 - 2P$

$$\Rightarrow 4P = 200 \Rightarrow P = 50$$

$$\therefore Q = 20 + 2(50) = 120$$

$$\therefore Q = 120, P = 50 \text{ At Equilibrium}$$

c. What is the cross-price elasticity of DVD players with respect to good A? Are DVD players and good A substitutes, complements or unrelated? Explain

$$E_{Q_{DVD}, P_A} = \frac{\Delta Q_{DVD}}{\Delta P_A} \times \frac{P_A}{Q_{DVD}} = \frac{\partial Q_{DVD}}{\partial P_A} \times \frac{P_A}{Q_{DVD}}$$

$$Q_D = 50 - 2P + 4P_A - 3P_B + 0.05I$$

$$\frac{\partial Q_{DVD}}{\partial P_A} = 4 \quad \therefore E_{Q_{DVD}, P_A} = 4 \times \frac{45}{140} = 1.29$$

$$Q_{DVD} = 50 - 2(40) + 4(45) - 3(20) + 50$$

$$= 140$$

\* DVD & good A are substitutes, because cross elasticity is positive

$$E_{Q_{DVD}, P_A} > 0$$

12

because when  $P_A$  ↑ by 1\$, the  $Q_D$  (DVD) will increase by 4 units