Part A: Multiple Choice Questions (2 pts. each, total 40 pts.)

1. Production efficiency occurs when production _______.
   A. is at a point beyond the production possibilities frontier.
   B. is on the production possibilities frontier or inside it.
   C. is at any attainable point.
   D. is on the production possibilities frontier.

2. When each extra worker adds less to output than the previous extra worker added, this is an example of:
   A. the law of constant returns.
   B. the law of increasing returns.
   C. the law of diminishing returns.
   D. labour law.

3. If goods J and K are close substitutes, an increase in the price of J causes:
   A. quantity demanded of J to fall and the demand for K to decrease.
   B. a decrease in quantity demanded for J and an increase in K.
   C. quantity demanded of J remains constant, but the demand for K decreases.
   D. the demand curve for both J and K shift.

4. If the price elasticity of demand is elastic, then _________.
   A. a reduction in price causes a reduction in total revenue.
   B. an increase in price causes a decrease in total revenue.
   C. an increase in price causes an increase in total revenue.
   D. an increase in price causes no change in total revenue.

5. When a good is normal, an increase in income causes the:
   A. supply curve of the good to shift to the right.
   B. demand curve of the good to shift to the left.
   C. prices of complementary goods to fall.
   D. demand curve of the good to shift to the right.
6. A technological improvement will normally cause __________.
   A. the supply curve to shift to the right.
   B. a movement along the supply curve such that quantity supplied declines.
   C. an individual to increase consumption of any goods she purchases.
   D. a movement along the supply curve such that quantity supplied increases.
   E. the supply curve to shift to the left.

7. In the figure above, market shortage is represented by the distance:
   A. AB
   B. FG
   C. FA
   D. BG

8. When two goods are substitutes for each other:
   A. the cross price elasticity of demand is negative.
   B. the cross price elasticity of demand equals zero.
   C. **the cross price elasticity of demand is positive.**
   D. the cross price elasticity of demand may be either positive or negative.

9. According to the law of diminishing marginal utility, the additional level of satisfaction that you get from consuming apple pie decreases:
   A. as the price of apple pie falls.
   B. with every additional slice of apple pie that you eat.
   C. your income rises and you can substitute more exotic desserts.
   D. as you get older.

10. In the figure above, the change from DD to D'D' represents a decrease in demand.
    A. True
    B. False
11. A consumer's budget constraint describes:
   A. the amount of each good that the consumer buys.
   B. the combinations of goods that a consumer can afford to buy.
   C. all those goods not strictly limited to the consumer's income.
   D. goods outside the consumer's possible consumption basket.

12. An increase in the consumer's money income:
   A. causes a parallel outward shift in the budget line, if prices remain constant.
   B. rotates the budget line outward since more of at least one good can be consumed.
   C. causes a parallel shift of the budget line towards the origin.
   D. rotates the budget line toward the origin since less of at least one good is consumed.

13. Each point on the demand curve reflects
   A. all the wants of a given household.
   B. the highest price consumers are willing and able to pay for that particular unit of a good.
   C. the highest price sellers will accept for all units they are producing.
   D. the lowest-cost technology available to produce a good.

14. When an extra unit of a good is consumed, total utility changes by an amount equal to:
   A. the price of the extra unit consumed.
   B. the marginal utility gained or lost by consuming the extra unit.
   C. the average utility of all goods consumed.
   D. the total utility divided by the number of units previously consumed.

15. At every point along an indifference curve, the:
   A. the combination of goods yield the same level of utility.
   B. prices of all goods are constant.
   C. the consumer can have a combination of more of one good without less of the other good.
   D. consumer's income is constant.

16. What happens to the demand for DVDs if the price of a DVD player falls?
   A. The demand for DVDs decreases because the price of a substitute falls.
   B. The demand for DVDs increases because the price of a complement falls.
   C. The demand for DVDs decreases because the price of a complement falls.
   D. The demand for DVDs remains unchanged.

17. People come to expect that the price of a gallon of gasoline will rise next week. As a result,
   A. today's supply of gasoline increases.
   B. today's demand for gasoline increases.
   C. the price of a gallon of gasoline falls today.
   D. next week's supply of gasoline decreases.

18. The market demand curve is ____________
   A. derived by vertically summing the individual demand curves at each quantity.
   B. derived by horizontally summing the individual demand curves at each price.
   C. derived by vertically summing the individual demand curves at each price.
   D. derived by horizontally summing the individual demand curves at each quantity.
   E. independent of individual demand curves.

19. The supply curve depicts the relationship between price and quantity supplied holding other things constant. What are those other things?
   A. The production technology, cost of inputs, government regulations and firms' expectations
   B. The income of consumers and consumer preferences
   C. The price of related goods
D. Both B and C.

20. The primary focus of economics is on
   A. the related problems of scarcity and choice.
   B. how to make money on the stock market.
   C. why there are no choices to be made.
   D. mathematical estimation of theoretical models.
   E. market economics, but not centrally planned ones.

Part B: Essay Questions (60 points)

1. Use the demand and supply schedules below to answer the following questions. (18 pts.)

<table>
<thead>
<tr>
<th>Price per shoe (TL)</th>
<th>Quantity Demanded /monthly</th>
<th>Quantity Supplied /monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>50</td>
<td>250</td>
</tr>
<tr>
<td>60</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>50</td>
<td>150</td>
<td>150</td>
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<td>40</td>
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<td>100</td>
</tr>
<tr>
<td>30</td>
<td>250</td>
<td>50</td>
</tr>
<tr>
<td>20</td>
<td>300</td>
<td>0</td>
</tr>
</tbody>
</table>

A. Draw the demand and supply curves for shoes on the same graph by using the information above. (Label the curves appropriately). (6 pts.)

B. What is the equilibrium price and quantity? (2 pts.)

Answer: As shown by the point A, the equilibrium price and quantity are 50 TL and 150, respectively.
c. Suppose that the price of a pair of shoe is 40TL. What would be the quantity supplied and quantity demanded of shoes at this price? Is there a surplus or shortage at this price? (4 pts.)

**Answer:** At the price level of 40 TL the quantity supplied would be 100 shoes while the quantity demanded would be 200 shoes. This suggests that there would be a shortage of 100 shoes, i.e. 200 - 100, at this price.

d. Assuming that the cost of leather has decreased and shoe production increased by 100 units/monthly at each price. Show on the above graph and explain what will be the effect of this event on the market demand, supply, equilibrium price and quantity of shoes? (6 pts.)

**Answer:** As shown in the graph above, the rise in the production of shoes leads to a shift in the supply curve from \( S_0 \) to \( S_1 \). As a result of the increase in supply, the market comes to a new equilibrium at point \( B \) where the equilibrium price is 40 TL and equilibrium quantity is 200 shoes. In other words, the increase in the production of shoes leads to (i) a higher supply, (ii) higher quantity supplied and quantity demanded, (iii) lower equilibrium price, and (iv) higher equilibrium quantity of shoes.

2. As shown in the table below, suppose when the price of pizza is $4, the quantity demanded of pizza is 60 slices and the quantity demanded of cheese bread is 100 pieces. When the price of pizza is $2, the quantity demanded of pizza is 80 slices and the quantity demanded of cheese bread is 70 pieces. (12 pts.)

<table>
<thead>
<tr>
<th>Price of Pizza</th>
<th>Quantity Demanded of Pizza</th>
<th>Quantity Demanded of Cheese Bread</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4</td>
<td>60 slices</td>
<td>100 slices</td>
</tr>
<tr>
<td>$2</td>
<td>80 slices</td>
<td>70 slices</td>
</tr>
</tbody>
</table>

A. Calculate the price elasticity of demand for pizza. (4 pts.)

**Answer:** The table above shows that the price of pizza has decreased from $4 to $2. As a result of this decrease in the price, quantity demanded of pizza has increased from 60 to 80 slices. Therefore, the price elasticity of demand for pizza can be calculated as follows.

\[
PED = \frac{\Delta Q^D}{\Delta P} \times \frac{P^\text{avg}}{Q^\text{avg}^D} = \frac{20}{2} \times \frac{3}{70} = -0.43
\]

B. Is the demand for pizza elastic, inelastic or unit elastic? (2 pts.)

**Answer:** The result of (-)0.43 suggests that the percentage decrease in price of pizza is greater than the percentage increase in quantity demanded for pizza. That is to say, the absolute value of the price elasticity is less than 1, and therefore, the demand for pizza is price inelastic.

C. Calculate the cross-price elasticity of cheese bread. (4 pts.)

**Answer:** Following the decline in the price of pizza, the quantity demand of cheese bread has decreased by 30 units. Therefore, the cross-price elasticity of cheese bread is:

\[
PED_{p-c} = \frac{\Delta Q^C}{\Delta P^p} \times \frac{P^\text{avg}^C}{Q^\text{avg}^C} = \frac{-30}{-2} \times \frac{3}{85} = 0.53
\]
D. Are these goods substitute or complement? Briefly explain. (2 pts.)

**Answer:** Given that the demand for cheese bread decreases as a result of the fall in the price of pizza, which also suggests that the cross-price elasticity of cheese bread is positive, these goods are substitute to each other.

3. The figure below illustrates the market demand and supply for cell phones. (10 pts.)

A. Shade and label the consumer and producer surplus on the graph. (2 pts.)

**Answer:** As shown in the graph above, consumer surplus (CS) at the equilibrium price is the area between the demand curve (i.e. consumers’ willingness to pay) and the price of the good. On the other hand, producer surplus (PS) is the area between the supply curve (i.e. producers’ willingness to accept) and the price of the good.

B. Calculate the consumer surplus. (4 pts.)

**Answer:** Consumer surplus is calculated as follows.

\[ CS = \frac{(60-30) \times 100}{2} = 1,500 \]

C. Calculate the producer surplus. (4 pts.)

**Answer:** Producer surplus is calculated as follows.

\[ PS = \frac{(30-15) \times 100}{2} = 750 \]
4. Answer the following questions given the indifference curves diagram below. (20 pts.)

A. Which one of the combinations on the above diagram gives more satisfaction, A, D or C? Why? (2 pts.)

**Answer:** Given that combination of D and C are on the indifference curve $I_1$, which yields higher utility than the indifference curve $I_0$, both combinations give more satisfaction than the combination A. However, the consumer is indifferent between the combinations D and C.

B. Draw on the same diagram above the consumer’s budget line for income = $20, Px = $2 and Py = $4. (4 pts.)

**Answer:** Given the budget of $20, the consumer (i) can consume maximum of 5 Y, i.e. 20/4, if s/he spends all of the budget on Y, or (ii) can consume maximum of 10 X, i.e. 20/2, if s/he spends all of the budget on X. Therefore, the budget line BB’ is drawn above.

C. What is the slope of the budget line? (3 pts.)

**Answer:** The slope of the budget line is:

$$\frac{\Delta Y}{\Delta X} = -\frac{5}{10} = -0.5$$

or

$$-\frac{P_Y}{P_X} = -\frac{2}{4} = 0.5$$

D. What is the marginal rate of substitution at point C? (3 pts.)

**Answer:** Given that the point C is where the budget line is tangent to the indifference curve, the marginal rate of substitution at that point is equal to the price ratio of X and Y:

$$MRS_{X,Y} = -\frac{P_X}{P_Y} = -\frac{2}{4} = 0.5$$
E. Show best affordable combination (utility maximizing quantities) of good X and good Y on the same graphics. What are the quantities of good X and good Y at that combination? (4 pts.)

Answer: The best affordable combination of good X and good Y is 6 units of X and 2 units of Y, i.e. point C on the graph above.

F. What can you say about slopes of the budget line and the indifference curve at the utility maximizing point? Relate your answer to parts (c) and (d). (4 pts.)

Answer: As we can see from parts (c) and (d), the slopes of the budget line and that of the indifference curve at the utility maximizing point C are equal to each other.

Bonus Question (5 pts.)
A simple economy has 100 workers and produces two goods of X and Y. X is a necessity good (food) and Y is a luxury good (music and entertainment). Assume that each worker can produce 5 of good X and 10 of good Y in a month, with a constant marginal productivity of labor.

A. Draw the PPF of this simple economy. Where does the PPF curve intersect with Y and X axes and what do these points mean? (3 pts.)

Answer: Given the production capacity and the number of labor in the economy, the PPF is as shown above by the straight line AB. The PPF suggests that (i) if all of the workers produce only good Y, there will be 1000 units of Y produced (point A), and (ii) if all of the workers produce only good X, there will be 500 units of X produced (point B) in the economy.

B. Assume that this economy is producing inside of the PPF. Give at least two reasons why this economy is inefficient and what can be done in order to make it efficient. (2 pts.)

Answer: Suppose that the economy is producing at the point C, where a total of 200 units of X and 300 units of Y are being produced. The production at this point is considered to be inefficient because given the resources available in the economy, it is still possible to produce 300 (200) unit of Y (X) and increase the production of X (Y) to 350 (600), and be on the PPF at point D (E). In order to reach the efficiency, (i) the current technology might be utilized in a better way, (ii) the available inputs might be fully utilized,
and (iii) more workers might be employed and allocated to industries where the production is missing, e.g. to X in the case of moving from point C to D.