

**Midterm Exam**  
**Undergraduate Program in Economics**

Course : Microeconomic Theory 2  
Instructor : Prani Sastiono  
Time : 180 Menit  
Type : **Closed book and closed note for AACSB Question.**  
Open Note (A4 1 piece both sides) for other questions.

*There are three problem sets.*

- *The first set is for AACSB assessment. Closed book and closed note (35 points).*
- *Students are free to use cheating sheet for the second and third set of problems (65 points)*
- ***Answer AACSB problem set in separated sheet!***
- ***Cheating Sheet and New answer sheet would be distributed after student collected their AACSB assessment.***

**Question 1: AACSB problem set (35 points)**

Jennie likes to watch tv shows and she needs help to decide how she should allocate her money to buy streaming passes. Jennie loves to watch Korean drama as much as American TV shows. Therefore, her preference on streaming sites (**Viu, Netflix**) =  $(x_1, x_2)$  can be represented by this following utility function:1

$$U(x_1, x_2) = x_1^{0.5} x_2^{0.5}$$

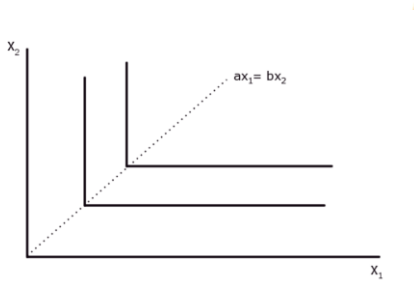
Consumer has a given income/ wealth ( $I$ ) and faces  $p_1$  as price of Viu streaming pass and  $p_2$  as a price of Netflix streaming pass.

- a. Find Walrasian/**Marshallian demand function** of both goods! (7 points)
- b. Find **Indirect Utility Function!** (5 points)
- c. Using Duality Theorem, find the **expenditure function!** (5 points)
- d. Using Shepard's Lemma, find the **Hicksian demand function** of both goods! (6 points)
- e. Initially, Viu stream pass price is  $p_1 = \$25$  and Netflix stream pass price is  $p_2 = \$100$  while Jennie's budget per semester for movie streaming is  $I = \$500$ . However, in order to get new customers Netflix is giving discounts. Thus, Netflix price decreases from \$100 to \$64 ( $p_2^0 = \$100 \rightarrow p_2^1 = \$64$ ). Find the substitution and income effect for Viu ( $x_1$ )! **Use both figure/graph and math/equation!** (12 points)

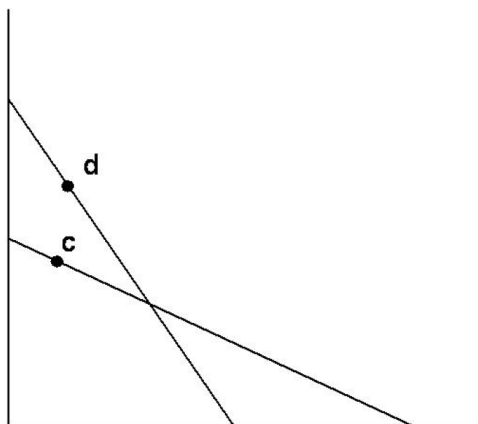
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**Question 2: Provide short and clear explanation to answer these questions! (35 points)**

- Meghan and Harry are painting a room for their new baby boy. At the paint store, Harry says he prefers Navy to Ordinary Blue, Light Blue, and Green Blue. Teddy also prefers Sky Blue to Navy, and prefers Pool Blue to Navy. He also prefers Sky Blue to Pool Blue. The store is out of Sky Blue, so they buy Pool Blue and paint their apartment with it. Harry then insists that they go back, and buy Light Blue, and repaint the apartment. **In your opinion, is Harry rational? (5 points)**
- What happens to Marshallian demand when **prices and income changes proportionately at the same rate? (5 points)**
- Lisa's preference can be expressed using Leontief utility function  $U = \min(ax_1, bx_2)$  as graphed below. **Explain shortly what axioms are violated! (5 points)**



- If the good is normal, what is **the sign of total effect** of own price increase (substitution effect + income effect)? (5 points)
- Do consumer choices at  $c$  and  $d$  **violate WARP?** (5 points)



- The utility function of a consumer is  $U(X_1, X_2) = X_1 + X_2$  and a consumer faces a budget constraint  $p_1x_1 + p_2x_2 = w$ , where  $p_1=1$ ,  $p_2=1$ ,  $w=10$ , then **calculate the Marshallian demand!** Is the solution **unique?** If  $p_2$  increases to 2 (from  $p_2=1$  to  $p_2=2$ ) recalculate the Marshallian demand! Is it unique? (10 points)

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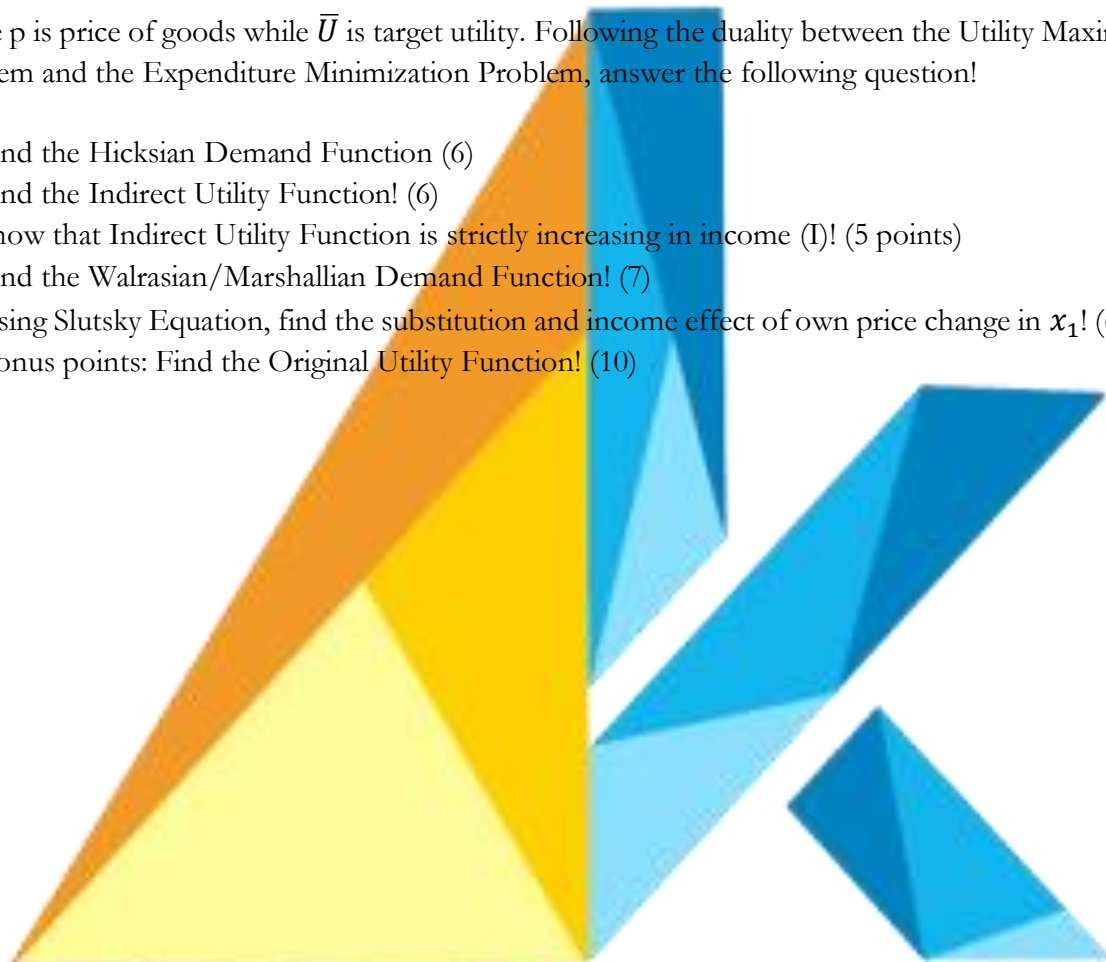
### Question 3: (30 points +10 bonus points) Duality and Slutsky Equation

Consumer's expenditure function is the following:

$$e(p_1, p_2, \bar{U}) = \bar{U}(p_1^{0.5} + p_2^{0.5})^2$$

where  $p$  is price of goods while  $\bar{U}$  is target utility. Following the duality between the Utility Maximization Problem and the Expenditure Minimization Problem, answer the following question!

- Find the Hicksian Demand Function (6)
- Find the Indirect Utility Function! (6)
- Show that Indirect Utility Function is strictly increasing in income ( $I$ )! (5 points)
- Find the Walrasian/Marshallian Demand Function! (7)
- Using Slutsky Equation, find the substitution and income effect of own price change in  $x_1$ ! (6 points)
- Bonus points: Find the Original Utility Function! (10)



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