Problem Set of Final Exam
Microeconomics 2 (ECEU600102) - C

Date : Monday, December 16, 2019
Duration : 150 Minutes
Course : Microeconomics 2 (Advanced Microeconomics)
Instructors : Chaikal Nuryakin dan Prita Nurmalia
Time : 150 Minutes
: Closed Book & can use a non-scientific calculator

Question 1 Cost Function and Conditional Input Demand [35 points]
A firm facing constant input prices *w* and *r* has the following production function:

$$y = x_K^{0.25} x_L^{0.25}$$

Denote output as *Q*. x_k is the amount of capital. x_L is the amount of labor.

a) Find the marginal product of capital and labor! Is there diminishing marginal product of labor? Is there diminishing marginal product of capital? (5 points)
b) Find the elasticity substitution of input K for input L! (6 points)
c) Explore whether the production function exhibits increasing, decreasing, or constant returns to scale! (5 points)
d) Find the firm's demand for *K* and *L* contingent on their choice of output *Q* (the firm's conditional input demand)! (10 points)
e) Derive the cost function $C(w, r, Q)$ for this firm! (5 points)
f) How much will the firm produce? (4 points)

Question 2 Profit function [20 points]

Given the production function $y = x_K^{\alpha} x_L^{1-\alpha}$

Where x_k is the amount of capital and x_L is the amount of labor. The firm is facing *w* for labor wages and *r* for the price of capital. Let's denote *p* as the output price.

a) Calculate the profit maximizing demand function (demand for inputs)! (7 points)
b) Calculate the profit maximizing supply function! (7 points)
c) Find the profit function! (6 points)

Question 3 General Equilibrium [25 points]

Jojo has an endowment of 200 units of good X and 5 units of good Y. Nina has an endowment of 100 units of good X and 5 units of good Y. U_A is Jojo's utility function and U_B is Nina's utility function.

$$U_A = X_A Y_A \text{ and } U_B = X_B Y_B$$

a) Draw the Edgworth box and show the contract curve. (8 points)
b) Formulate the utility maximization problem for each consumer. (7 points)
c) Find a competitive equilibrium price vector and allocation for this economy if it exists. If there is no equilibrium, explain the reason. (10 points)

Question 4: Theory [20 points]

a) Explain the first and the second fundamental theorem of welfare economics! Describe the relation between them! (10 points)

b) True or false. Explain your answers.

   a. If a production function has diminishing marginal productivity, then it must have decreasing returns to scale. True or false? (5 points)

   b. In the short run, total cost is equal to zero when output is equal to zero. True or false? (5 points)

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