KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN ECONOMICS

EET 900: MICROECONOMICS I

DATE: MONDAY 28TH NOVEMBER 2016 **TIME: 9.00 A.M. - 12.00 P.M.**

INSTRUCTIONS: Answer ALL Questions

Question One

Consider the case of two counties in Kenya with a competitive advantage in producing two different products. County A has a production function $X = 4L^{\frac{1}{4}}$, where X is output and L the input of labour. Let p_X be the price of X, and W be the wage of labour. County B buys X and produces Y from it with a production function $Y = X^{\frac{1}{2}}$. The price of Y is p_Y. The markets for Y and L are assumed to be competitive. County B acts as a competitor in the market for X.

a) Derive the equilibrium values of L, X and Y. 1 marks

b) How do L, X and Y change as W, p_X, *and* p_Y change? 8 marks

Question Two

An individual consumes only goods 1 and 2, and his preferences over the two goods can be represented by the utility function $U(x_1, x_2) = x_1^{\alpha} x_2^{\beta}$ where $\alpha, \beta > 0$ and $\alpha + \beta > 1$ or $\alpha + \beta < 1$. The individual currently works for a firm in a city where initial prices $p^0 = (p_1, p_2)$ and his wealth is w.

(a) Find the Walrasian demands for the individual 3 marks

(b) Find the indirect utility function for the individual 3 marks

(c) The firm that this individual works for is considering moving its office to a different city where good 1 has the same price but good 2 is twice as expensive. Find the value of the indirect utility in the new location 4 marks

(d) Find the individual's equivalent variation and compensating variation due to price change 5 marks

Question Three

(a) Suppose that there are J single output plants. Plant $j's$ average cost is given as $AC_j(q_j) = \alpha + \beta_j q_j$ for $q_j \geq 0$. What is the cost minimizing aggregate production plan for producing a total output q where $q < \dfrac{\alpha}{\max\limits_j \beta_j}$. Assume $j = 1,2$ (7 marks)

(b) Given that $y = \left[\min\left(x_1^{\frac{-1}{\alpha}}, x_2^{\frac{\alpha}{3}}\right)\right]^{\frac{\alpha}{\beta}}$. (i) Find the input demand functions. (ii) Determine output supply function. (8 marks)

Question Four

(a) Using algebraic derivation, show that second order condition for cost minimization implies that any change in factor inputs that keep costs constant entails output declining as movement is made from the equilibrium point. (2 marks)

(b) A fast food chain manufactures output, y according to a fixed coefficient (Leontief) technology, requiring α units of labor and β units of ground beef to produce a unit of y. In addition, one unit of a manager's time is required to oversee the production process no matter how much is produced.

(i) Suppose the demand for the firm's output is downward sloping and its revenue function, R(y), is strictly concave. Let c denote the price of ground beef, w the wage rate, and m the cost of the manager's time. Derive the first order conditions for the optimal production/supply of y and briefly discuss the properties of the profit function $\pi(c, w, m)$ (7 marks)

(ii) Suppose the chain were to sell the franchise to the manager for an amount F. The manager would then choose y to maximize profits subject to the requirement that it must purchase all of its beef from the parent company at price p. What choice of p and F would maximize the profits of the parent company (which consist of the fee F plus profits from the sale of beef)? What will happen to the price of fast food to consumers? (6 marks)