



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

**FIRST YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF
MASTER OF ARTS IN ECONOMICS**

CITY CAMPUS - WEEKEND

AEC 801: ADVANCE MICROECONOMICS

Date: 5th December, 2015

Time: 9.00 - 12.00pm

INSTRUCTIONS:

- Answer FOUR Questions
- Each Question carries 15 marks



1. (a). Suppose a rational consumer's utility model is given as

$U = \phi(q_1, q_2) = q_1 q_2$, assuming further that the consumer's budget constraint is specified as: $y^0 = p_{q_1} q_1 + p_{q_2} q_2$, where P_{q_1} and P_{q_2} are the unit prices of the goods q_1 and q_2 respectively.

(i). Show that the demand model for $q_1 = \frac{y^0}{2P_{q_1}}$ and that of $q_2 = \frac{y^0}{2P_{q_2}}$. (7marks)

(ii). Prove that at the optimum point, $\frac{P_{q_1}}{P_{q_2}} = \frac{U'_{q_1}}{U'_{q_2}}$ (5marks)

(iii). If the consumer's utility curve passes through point (20, 60) determine the marginal rate of commodity substitution associated with that point. (3marks)

2. (a). Given a production function expressed as $Q = \phi(K, L) = \lambda K^\alpha L^\beta$, where $\alpha + \beta$ represents the degree of homogeneity. Show that the elasticity of substitution

between the two factor inputs (σ) = $\frac{\partial \text{Log} \frac{K}{L}}{\partial \text{Log} R} = 1$, where R = Marginal rate of technical substitution of capital for labour. (8marks)

(b). Murphy produces two types of automobile vacuum cleaners "A" and "B", where "A" plugs into the cigarette lighter receptacle while "B" has rechargeable batteries. On the basis of substitutability between the two products in consumption, the manager of Murphy wanted to determine the profit maximizing levels of production and price for the two products. The market research department made the following forecasts of demand functions for the two products:

$Q_A = 80 - 8P_A + 6P_B$; $Q_B = 40 - 4P_B + 4P_A$, where the outputs were measured in thousand units and the prices in dollars per unit. The production manager provided the following estimates of incremental costs: $MC_A = 10 + 0.5Q_A$; $MC_B = 20 + 0.25Q_B$

Determine the profit maximizing level of output and price. (7marks)

3. "The compensated Hicksian demand curve cannot be upward-sloping."

Discuss using illustrations where possible. (15marks)

3. (a). Assuming the following specifications for a hypothetical commodity market model:

$$Q_{d1} = \phi(P_1, P_2) = a_0 + a_1P_1 + a_2P_2$$

$$Q_{s1} = \phi(P_1, P_2) = b_0 + b_1P_1 + b_2P_2$$

$$Q_{d2} = \phi(P_1, P_2) = \alpha_0 + \alpha_1P_1 + \alpha_2P_2$$

$$Q_{s2} = \phi(P_1, P_2) = \beta_0 + \beta_1P_1 + \beta_2P_2$$

$$\text{If } C_i = a_i - b_i$$

$$\gamma_i = \alpha_i - \beta_i$$

$$\forall i = 0, \dots, 2$$

- (i). Show that at the optimal point, $\bar{P}_1 = \frac{C_2\gamma_0 - C_0\gamma_2}{C_1\gamma_2 - C_2\gamma_1}$ and $\bar{P}_2 = \frac{C_0\gamma_1 - C_1\gamma_0}{C_1\gamma_2 - C_2\gamma_1}$ (10 marks)
- (ii). What restrictions should be imposed on the models for the optimal prices to make economic sense. (5marks)

5. (a). "Price discrimination is socially desirable." Discuss. (5marks)
- (b). Suppose the demand in market 1 is specified as $P_1 = 98 - 2Q_1$, while the demand in market 2 is $P_2 = 50 - 0.5Q_2$ and the firm has the following linear total cost function $C = 1500 + 2Q$, where $Q = Q_1 + Q_2$, determine the profit realized with and without price discrimination. (10marks)

6. Discuss the theory of the second best as used in welfare economics. (15marks)