

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF  
DOCTOR OF PHILOSOPHY IN AGRICULTURAL ECONOMICS**

**AGEC 911: ADVANCED MICROECONOMICS THEORY AND PRACTICES**

**STREAMS: MSC (AGEC)**

**TIME: 3 HOURS**

**DAY/DATE: MONDAY 10/12/2018**

**2.30 PM-4.30 PM**

**INSTRUCTIONS:**

**Answer Question One and any other Two Questions**

**QUESTION ONE (20 MARKS)**

- (a) Explain the first order and second order conditions for maximization of a multiple-variance function. [2 marks]
- (b) Explain the following terms
- (i) Adverse selection [2 marks]
  - (ii) Signaling and screening [3 marks]
  - (iii) The principle agent problem [3 marks]
  - (iv) Nash equilibrium [3 marks]
- (c) On a given evening J.P enjoys the consumption of cigars (c) and beer (b) according to the following function
- $$U(c, b) = 20c - c^2 + 18b - 3b^2$$
- (i) How many cigars and glasses of brandy should he consume to maximize utility during an evening? (cost is not a constraint to J.P) [3 marks]
  - (ii) Lately, however, J.P has been advised by his doctors that he should limit the sum of glasses of brandy and cigars consumed to 5. How many glasses of brandy and cigars will he consume under these circumstances? [4 marks]

**QUESTION TWO (20 MARKS)**

- (a) Which of the two statements below involves positive economic analysis and which one involves normative economic analysis? Explain your answer. [4 marks]
- (i) Gasoline rationing (allocating to each individual a maximum amount of gasoline that can be purchased each year) is a poor social policy because it interferes with the workings of the competitive market system.
- (ii) Gasoline rationing is a policy under which more people are made worse-off than better-off.
- (b) Using the theory of consumer behavior to illustrate, distinguish between the direct and indirect approaches to verification economic models using scientific enquiries or research. [4 marks]
- (c) Using suitable examples discuss the main differences between economic costs and accounting costs. [4 marks]
- (d) A factory manufactures 2 types of heavy-duty machines in quantities X and Y. the joint cost function is given by  $C = X^2 + 2Y^2 + XY$
- (i) How many machines of each type should the factory produce to minimize cost if the factory is restricted to produce a total of 8 machines? [6 marks]
- (ii) What is the minimum joint cost given the quantities determined above. [2 marks]

**QUESTION THREE (20 MARKS)**

- (a) An economic analyst sought to study the choice of agricultural goods by individual consumers in Embu, Municipal Market. Explain the axioms that characterize rational consumer behavior, which the analyst must assume in the study. [10 marks]
- (b) Economic models simplify the complex real-world situations to predict the behavior of economic agents when faced with certain changes in real world situations. Explain the three common features of micro-economic models that are used to simplify real world situations. [10 marks]

**QUESTION FOUR (20 MARKS)**

- (a) Discuss the major developments in economic modelling since World War II.

[15 marks]

- (b) Suppose the production function for producing a commodity is given by  

$$Q = KL - 0.8K^2 - 0.2L^2$$

Where Q is the annual quantity of the commodity produced, K is the annual capital input and L is the annual labour input. Using this production function answer the following questions

- (i) Suppose K=10. Graph the total and average product of labour curves from L=15 to L=35. At what level of labour input does average product reach a maximum? What is the quantity of output produced at that point?  
 [8 marks]

- (ii) Assuming K=10, graph on the same axis the labour marginal productivity curve from L=15 to L=35. At what level of labour input does  $MP_L=0$ ? What is the quantity of output produced at that point?  
 [7 marks]

**QUESTION FIVE (20 MARKS)**

- (a) Using graphical illustrations, discuss price determination in the very short run and short run market periods in a perfectly competitive industry. [10 marks]
- (b) The following are individual demand functions for oranges

$$X_1 = 10 - 2P_x + 0.1I_2 + 0.5P_y$$

$$X_2 = 17 - P_x + 0.05I_2 - 0.5P_y$$

$P_x$  = Price of oranges.

$P_y$  = Price of a substitute good

$I_1$  = Individual income

$I_2$  = Individual 2 income

$X_1$  = individual 1 quantity demanded

$X_2$  = Individual 2 quantity demanded

Assuming a market comprising the two individuals, answer the questions below:

- (i) Determine the market demand function, given  $I_1=40$ ,  $I_2=20$  and  $P_y=4$   
 [2 marks]

- (ii) Graph the market demand curve for oranges. [4 marks]

- (iii) Determine the market demand if the price of the substitute was to rise to  $P_y=6$   
 [2 marks]

(iv) In reference to (iii) above draw the new demand curve to show the shift in demand. [4 marks]

(v) The supply function of oranges in the very short run is given by:  $X_5=20$ . Determine the short run equilibrium price at  $P_Y=4$  and  $P_Y=6$ [3 marks]

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