

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

THARAKA CAMPUS

**EXAMINATION FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE
ECONOMICS**

MSEC 812: ADVANCED MICROECONOMICS II

STREAMS: MSEC Y1S2

TIME: 3 HOURS

DAY/DATE: TUESDAY 06/08/2019

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS:

- **Answer question ONE and any other TWO.**

QUESTION ONE

- (a) There is a constant relationship between competitive firm supply function and cost function. This is shown by upward sloping part of marginal cost (MC) curve above the average variable cost (AVC) in a perfect competitive firm. Proof mathematically this statement giving detailed explanation and a graph. (10 marks)
- (b) Distinguish in details the following microeconomic models
- (a) Cournot model and Bertrand model (3 marks)
 - (b) Nash equilibrium and strategic interdependence (3 marks)
 - (c) The rule and pay off (2 marks)
 - (d) Dorminant and dorminated strategies (2 marks)
- (c) Four oligopolists operate in a market with inverse demand given by $P = a - Q$ where $Q = Q_1 + Q_2 + Q_3 + Q_4$. Each firm has a constant marginal cost of production and no fixed cost. The firms chose their quantities as follows, first firm takes Q_1 , then firm 2, firm 3 and firm 4 observes Q_1 and simultaneously choose Q_2 , Q_3 and Q_4 respectively. What is the equilibrium quantities (Q_1, Q_2, Q_3 and Q_4) prices and profit? (10 marks)

QUESTION TWO

- (a) Consider the following demand function of the two firms with differentiated products

$$P_1 = \alpha - \beta q_1 - r q_2$$

$$P_2 = \alpha - \beta q_2 - r q_1$$

If the two products are identical $\beta = r$ required:

- (a) Proof that the two products are not well differentiated. (4 marks)
 (b) Calculate the equilibrium quantities of q_1 and q_2 . (4 marks)
 (c) Compute the respective prices of the firm P_1 and P_2 . (4 marks)
- (b) Explain the dead weight loss graphically. (8 marks)

QUESTION THREE

- (a) Suppose that an academic institution A is deciding whether or not to enter an educational market that is currently occupied by a monopolist institution M. If A stays out, then M gets a pay off of 30 and A gets a pay off of 0. If A enters, then M and A simultaneously choose which segment to occupy. There are two segments, a high segment and a lower segment. If both institutions occupy the high segment, they each get pay off of -5. If both institutions occupy the lower segment, they each get a pay off of -8. If M occupies the high segment and A occupies the low segment, M gets 8 and A gets -1. If M occupies the lower segment and A occupies the high segment, M gets a pay off of 5 and A gets a pay off of 4.

Required:

- (a) Show in tabular form the pay off matrix of their game and get the equilibrium. (5 marks)
 (b) Draw the game tree of this game and find the nash equilibrium using backward induction. (9 marks)
 (c) Pareto optimal condition requires the fulfillment of marginal conditions for optimal resource allocation. Discuss. (6 marks)

QUESTION FOUR

- (a) Consider the following principal agent condition. We have a principal P and an agent A. P wants to hire A for a one time project. If A works for P, A can choose either higher effort (e_H) or lower effort (e_L). Profits are either high (II_H) or low (II_L) with $II_H > II_L$. Assume further that the level of effort does not fully determine the level of profits. If A chooses e_H then profits are II_H with probability P_H and II_L with probability $P(1 - H)$. If A chooses e_L then profits are II_L with probability P_L and II_L with probability $P(1 - L)$. P maximizes expected profit from the project less the expected wages to the the agent.

Determine the maximum expected utility given wage (w) and effort (e) as follows

$$U(w, e) = V(w) - e \quad (15 \text{ marks})$$

(b) Write short notes on the following terminologies

(a) Feasible strategy set (2 marks)

(b) Dynamic games (3 marks)
