

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF MASTER OF SCIENCE IN ECONOMICS

MSEC 812: ADVANCED MICROECONOMIC THEORY II

STREAMS:

TIME: 3 HOURS

DAY/DATE: MONDAY 4/12/2017

2.30 P.M – 5.30 P.M

INSTRUCTIONS:

- Answer all questions

- (a) Explain clearly the theory of second best as used in economics. [5marks]
 - (b) It is claimed that the upward sloping part of marginal cost (MC) curve above the average variable cost (AVC) curve represent the supply function of perfect competition firm. Prove this mathematical and show using the diagram. [10marks]
 - (c) State derive and explain the lerner index of market power. [10marks]
- (a) Assume two differentiated firms 1 and 2 supply the market. For simplicity assume also that there are no fixed costs and marginal cost per unit is constant at C. Suppose the demand functions for these firms are;

$$P_1 = 200 - 2q_1 - 3q_2$$

$$P_2 = 200 - 2q_2 - 3q_1$$

Compute the cournot equilibrium quantities, prices and profits. [15marks]

- (a) Suppose that a firm E is deciding whether or not to enter a market that is currently occupied by a monopolist M. If E stays out, then M gets a payoff of 20, and E gets a payoff of 0. If E enters, then E and M simultaneously choose which segment to occupy. There are two segments, a high segment and a low segment. If both firms occupy high

segment, they each get payoff of -3. If both occupy low segment, they each get a payoff of -5. If M occupies the high segment and E occupies the low segment, then M gets a payoff of 5 and E gets a payoff -1. If M occupies the low segment and E occupies high segment, M gets a payoff of 3 and E gets a payoff of 4.

Required:

- (a) Set up the payoff matrix of this game. [2marks]
- (b) Identify the Nash equilibrium of the game. [3marks]
- (c) Draw the game tree. [4marks]
- (d) Describe how the firm M's optimal strategy depends on his beliefs about firm E's strategy. [8marks]
- (e) Describe how firm E's optimal strategy depends on the firm M's strategy. [8marks]

4. Consider the following principal-agent situation. We have a principal, P and agent A. P wants to hire A for a one time project. If A works for P, A can choose high effort, e_H , or low effort e_L . Profits are either high π_H or π_L , with $\pi_H > \pi_L$. If A chooses e_H then profits are π_H with probability p_H and π_L with probability $1 - p_H$. If A chooses e_L then profits are π_H with probability p_L and π_L with probability $1 - p_L$.

P maximizes expected profits from the project, less the expected wages to the agent A. P maximizes expected utility as follows given a wage w , and effort, e .

$$U(w, e) = V(w) - e$$

Where $V'(w) > 0$ and $V''(w) < 0$

P designs a contract, A then accepts it or not and if A accepts, A then chooses an effort level. Assume that A has a reservation utility level of U_0 .

- (a) Show how to implement e_L and e_H if effort is observable and verifiable and agent is risk averse. [10 marks]
- (b) Answer part (a) above given that the agent is risk neutral. [5marks]
- (c) If e is not observable agent is risk neutral, show that p can still obtain the same payoffs as a in case (a). [10marks]