CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF MASTER OF SCIENCE IN ECONOMICS

MSEC 812: ADVACNED MICROECONOMIC THEORY II

STREAMS: MSEC **TIME: 3 HOURS**

DAY/DATE: THURSDAY 07/10/2021 **2.30 P.M. – 5.30 P.M.**

INSTRUCTIONS

- **Answer question One and any other three questions**
- **Do not write on the question paper**

Question one

a) Explain what you understand by the following terms used in game theory

i. Feasible strategy set (2 marks)

ii. Stackelberg model (2 marks)

iii. Dominant strategy (2 marks)

iv. Incomplete information game. (2 marks)

v. Bertrand model (2 marks)

b) With the use of well labelled diagram, explain the inefficiency associated with monopoly. (5 marks)

c) Suppose a firm in a perfectly competitive market has a cost function given as $C = 60Q + \frac{1}{2}Q^2$. Determine the supply function of this firm. (5 marks)

d) 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 competitive firm. Prove this mathematically and show using the diagram. (10 marks)

e) Explain the main causes of market failure. (10 marks)

Question two

a) Consider a market with three oligopoly firms. Suppose that the market demand curve is given by $P = a - Q$, where $Q = q_1 + q_2 + q_3$. Suppose there is a constant marginal cost C. Suppose these firms choose quantities as follows; first firm 1 chooses q1. Then firms 2 and 3 observe q_1 and then simultaneously choose q_2 and q_3 respectively. Calculate the equilibrium quantities, price and profits. (12 marks)

b) Relax the above assumption and assume it is a Cournot model. Prove that the joint output of the oligopolistic firms will be higher than the monopolistic output, but lower than the competitive output. (8 marks)

Questions three

a) State, derive and explain the Lerner index of market power. (10 marks)

b) Consider a Duopoly market. Demonstrate that if these firms compete by simultaneously choosing prices, then prices will be driven immediately down to the perfect competitive solution. (10 marks)

Question four

a) Explain clearly the theory of second best as used in economics. (5 marks)

b) Gramery investments must decide whether or not to introduce a new product. If the firm indroduces the new product, its rival (Katom Limited) will have to decide whether or not to duplicate the new product. If Gramery does not introduce the new product, both firms will earn Ksh. 10 million each. If Gramery introduces the new product and Katom duplicates it, Gramery will lose Ksh. 50 million and Katom will earn Ksh. 200 million (this is because Gramery has spent a lot on research and development and Katom does not have to make this investment to compete with its duplicate). If Gramery introduces the new product and Katom does not duplicate, Gramery will make Ksh. 900 million and Katom will make Ksh. 0.

Required

a) Set up the payoff matrix of this game. (2 marks)

b) Identify the Nash equilibrium of the game. (2 marks)

c) Set up the game tree of this game. (3 marks)

d) Using backward induction approach, determine whether or not Gramery should introduce the new product. (3 marks)

e) How would the answer in (d) above change if Katom promised not to duplicate Gramery's product? (3 marks)

f) What would Gramery do if patent law prevented Katom from duplicating its products?

Note: d, e and f should be answered using backward induction

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