



# MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF ECONOMICS AND FINANCE

BACHELOR OF ECONOMICS

EET 400: MICROECONOMICS THEORY IV

DATE: 11/12/2019

TIME: 2.00-4.00 PM

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## INSTRUCTIONS:

Answer question one and any other two questions.

### QUESTION ONE (COMPULSORY) (30 MARKS)

A huge proportion of tea grown in Kenya is managed by Kenya Tea Development Authority (KTDA), which is owned by small scale farmers. The small-scale farmers are shareholders of about 68 firms operate in a competitive environment. Out of the 68 firms, 28 of them have a similar cost function given as  $C_1=10X_2$  and 40 other firms have an identical buyers at the Mombasa Tea Auction, each with the following demand function  $P=300-10X$ .

- a) Determine the equilibrium price and quantity in this industry. (10 marks)
- b) Use the necessary economic methodologies to show that the marginal cost curve above the average cost is the supply function of a firm operating in a competitive market. (5 marks)
- c) Show both algebraically and graphically that at the equilibrium level of output the welfare of the producers and consumers are maximized in a competitive industry. (5 marks)
- d) Distinguish between the following concepts as used in micro-economics. Use relevant economic methodology where necessary.
  - i. Dynamic game vs. sequential rationality
  - ii. Continuous public good v. private good
  - iii. Nash equilibrium vs. Feasible allocation
  - iv. Industry demand vs. aggregate supply
  - v. Backward induction v3 system of beliefs (10 marks)

## QUESTION TWO (20 MARKS)

- a) Explain three source sources of market failure (10 marks)
- b) Explain the inefficiency of a monopoly (4 marks)
- c) Show both mathematically and graphically that for a monopoly constrained by a linear demand function, the marginal revenue function will have a steeper slope and it will lie beneath the demand function (6 marks)

## QUESTION THREE (20 MARKS)

- a) Define a game from an economic perspective and describe important facets of a game (5 marks)
- b) You are given two firms facing identical, constant marginal cost and a linear market demand given by  $Q=500-20P$ .
  - i) Suppose the firms are involved in a Cournot game. Determine the optimal outputs and profits for the firms. (5 marks)
  - ii) Assume sets its quantity having observed the quantity chosen by the leading firm. Calculate the optimal outputs and profits for the two firms. Compare these with (i) above and comment. (10 marks)

## QUESTION FOUR (20 MARKS)

- a) Two telecommunication firms in Kenya offer the same communication service. Each charges a low price (L) of High price (H). Each firm wants to achieve the highest possible profit. If both firms choose H, then each firm earns a profit of Ksh. 10 million. If one firm chooses H and the other chooses L, the firm choosing H loses customers makes a loss of Ksh. 2 million, whereas the firm choosing L earns a profit of Ksh. 12 million. If both choose L, then each earns a Ksh. 6 million.
  - i. Suppose the firms move simultaneously. Represents this game in a tree/ extensive form and solve for Nash equilibrium if it exists. (6 marks)
  - ii. Suppose instead firm 1 is a leader, firm 2 chooses her price after observing the price charged by firm 1. represent this new move in a tree/extensive form (6 marks)
- b) Considering the special cases of monopoly, demonstrate the effect of a change in marginal cost of production on the price of the output (8 marks)

**QUESTION FIVE (20 MARKS)**

- a) Consider a case of two goods X and Y and two agents. Each agent cares about the other consumption of good X. Derive the condition for provision of a continuous public good (12 marks)
- b) Are all Walrasian equilibria competitive? Explain (8 marks)