MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF ECONOMICS AND STATISTICS

BACHELOR OF ECONOMICS AND FINANCE

BACHELOR OF ECONOMICS

BACHELOR OF COMMERCE

BACHELOR OF ARTS

EET 400: MICROECONOMIC THEORY IV

DATE: 17/8/2021   **TIME: 11.00-1.00 PM**

INSTRUCTIONS:

1. *Answer question ONE and any other TWO questions*
2. *Question ONE Carries a total of 30 marks, while all other questions carry 20 marks each*
3. *Being in possession of mobile phone and/or unauthorized electronic gadget constitutes an exam irregularity.*
4. *Being in possession of written materials, in exam room, in any form constitutes an exam irregularity.*
5. *Do not write on question paper*

QUESTION ONE (30 MARKS)

a)   Write short notes on the following concept in game theory

    i.   Dominant strategy   (2 marks)

    ii.   Nash equilibrium   (2 marks)

    iii.   Mixed strategy   (2 marks)

b)   Two duopoly firms face market demand of $Y = 25 - \frac{1}{2}P$. Assume the firms face a Marginal

Cost (MC) of Kshs. 10 per unit of output. Calculate, q_i and $\prod_i$ (8 marks)

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c) With the aid of a diagram illustrate how negative consumption externality in the cigarette market leads to market failure. (6 marks)

d) Given 5 consumers each with a demand: $X_i(P) = 20 - \dfrac{1}{2}P$. Firms Supply:

$\dfrac{P+2}{3} = Y(P)$, we also have m identified firms. Show how the equilibrium price responds to a change in the number of firms, and explain the implication. (6 marks)

e) Assume that this economy is in a Walrasian equilibrium with strictly positive prices and that all consumer's marginal utilities (of consumption goods) and all firm's marginal products (of inputs) are also strictly positive. Show that the *MRS* between any two consumption goods is the same for each consumer, and that it is equal to the ratio of their prices. (4 marks)

QUESTION TWO (20 MARKS)

Consider an economy with two goods -X and Y -and two agents -Ann and Bob. Ann and Bob wish to trade with one another in order to maximize their individual utilities. We will consider how their trading decisions depend on the initial endowments of X and Y and on their utility functions. Suppose Ann is endowed with one unit of X and half a unit of Y i.e. eAnn = (1,1/2)

and Bob is endowed with 1 unit of X and 1.5 units of Y i.e. eBob = (1, 3/2). Additionally,

suppose their utility functions are given by:

UAnn (X, Y)= XY

UBob(X, Y)= Y +2X

Required

a) Draw an Edgeworth box indicating the endowment and preferences of this problem.

(6 marks)

b) Find the set of Pareto Optimal Allocations in this economy and depict these in the Edgeworth box. What is this set of points called? (6 marks)

c) Find the equilibrium consumption of X and Y by Ann and Bob in this economy and determine the price ratio that supports this equilibrium (8 marks)

QUESTION THREE (20 MARKS)

a) Derive the condition for efficiency in provision of the continuous Public Good. (6 marks)

b) In a Stackelberg duopoly, one firm is a 'leader' and one is a 'follower'. Both firms know each other's costs and market demand. The follower takes the leader's output as given and picks his own output accordingly (i.e., the follower acts like a Cournot competitor). The leader takes the follower's *reactions* as given and picks his own output accordingly. Suppose that firms 1 and 2 face market demand, $p = 100 - (q1 + q2)$. Firm costs are $C_1 = 10q_1$ and $C_2 = q_2^2$

    i. Calculate market price and quantities for each firm (6 marks)

    ii. Calculate each firm's profit assuming that firm 1 is the leader and firm 2 the follower. (8 marks)

QUESTION FOUR (20 MARKS)

a) Consider the following game (Player One's Payouts in bolds):

	Player 2			
		left	middle	right
Player 1	up	**1**,2	**3**,5	**2**,1
	middle	**0**,4	**2**,1	**3**,0
	down	**-1**,1	**4**,3	**0**,2

Required

    i. Does either player have a dominant strategy? Explain. (4 marks)

    ii. Does either player have a dominated strategy? Explain. (2 marks)

    iii. Solve the equilibrium for this game. (6 marks)

b) Explain the four types of oligopolistic competition models (8 marks)

QUESTION FIVE (20 MARKS)

a) Answer the following question for each of the following examples:

    i. smoking by individuals;

    ii. toxic waste production by firms;

    iii. research and development by a high -tech firm;

    iv. individual vaccination against communicable illness.

Required;

Is there an externality? If so, describe it, including references to whether it is positive or negative, and whether it is a consumption or production externality. (12 marks)

b) A monopolist firm maximizes profits given by the function; $\underset{y}{Max}\ p(y)y - cy$. Using the standard comparative static, show and explain the sign and size of the change in price p due to a change in the cost under the following circumstance;

When the firm faces a linear demand function; $p(y) = a - by$ (8 marks)