



MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

FOURTH YEAR SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF ECONOMIC

EET 400: MICROECONOMIC THEORY IV

DATE:

TIME:

INSTRUCTIONS:

- (i) Answer question one (Compulsory) and any other two questions
- (ii) Do not write on the question paper
- (iii) Show your workings clearly

QUESTION ONE (COMPULSORY)

- a) Prove that the upward sloping segment of the marginal cost curve above the average variable cost curve is the firm's supply curve (4 marks)
- b) A monopolist firm maximizes profits given by the function; $\text{Max}_y p(y)y - cy$. Using the standard comparative static, show and explain the sign and size of the change in price p due to a change in the marginal cost c under the following circumstances.
 - i) When the firm faces a linear demand function; $p(y) = a - by$ (6 marks)
 - ii) When the firm faces a constant elasticity demand function; $y = Ap^{-b}$ (6 marks)
- c) Explain the main types of oligopolistic competition models (6 marks)
- d) Suppose a competitive industry consists of m identical firms, each with a cost function; $C(y) = y^2 + 1$. Suppose also that market demand is given by $P = 100 - Y$. Calculate:
 - (i) The industry supply curve (2 marks)
 - (ii) The relationship between P and m (2 marks)
 - (iii) The equilibrium number of firms in the market. (4 marks)

QUESTION TWO (20 MARKS)

Suppose two firms operate under conditions of identical, constant marginal costs, c . The market demand is given by $Q = 500 - 20P$

- i) Assume the firms play a Cournot game. Determine the level of output and profit for each firm (5 marks)
- ii) Suppose now firm one moves first and sets its output (quantity) and firm 2 observes the quantity chosen by firm 1 then sets its quantity. Determine the level of output and profit for each firm. Is your answer different from (i). Explain. (8 marks)
- iii) If now the firms engage in a Bertrand game, determine the level of output and profit for each firm. Explain any differences from (i) and (ii), if any. (7 marks)

QUESTION THREE (20 MARKS)

- a) With the help of relevant economic methodologies, explain any three solution mechanisms to the externalities problem. (9 marks)
- b) Suppose you have the following functions:

$$\text{Max } V(x) + y$$

Where:

$$y = W - C(x)$$

Derive the condition for welfare maximization.

(4 marks)

- c) Explain graphically the difference between the optimal provision of public goods and private goods (7 marks)

QUESTION FOUR (20 MARKS)

- a) Explain any four sources of market failure (8 marks)
- b) Assuming two agents with endowments for private good W_i , which they can use to contribute g_i for the provision of a public good G .
If the public good is discrete with marginal cost equals c , show that the efficient provision of the good will take place if and only if $r_1 + r_2 > c$
Where r_i is the agent i 's reservation price for the public good. (4 marks)

c) Given a matrix representation of a game as follows:

PLAYER 1	PLAYER 2			
		Product A	Product B	Product C
	Product D	3,6	7,1	10,4
	Product E	5,1	8,2	14,7
	Product F	6,0	6,2	8,5

- i) What is a nash equilibrium? (2 marks)
- ii) What is the difference between a dominated and a dominant strategy in a game (2 marks)
- iii) Compute the nash equilibrium of the game. (4 marks)

QUESTION FIVE (20 MARKS)

- a) Assuming a monopolist market with the firm's cost function given as $c = c(x_m, q_m)$ and representative consumer's utility function given as $U = V(x_m, q_m) + y$. Where x_m and q_m are the quantity and quality of the monopolist product respectively, while $V(x_m, q_m)$ and y are the consumer's utility from good x and left over income respectively.

Required

- i) Compute and explain the effect of a change in quality of monopolist output on the social welfare. (6 marks)
- ii) Compute and explain the effect of a change in quantity of monopolist output on the social welfare. (6 marks)
- b) Define the following terms used in game theory (8 marks)
 - i) Nash equilibrium
 - ii) Mixed Strategy
 - iii) Zero sum game
 - iv) Sequential game