

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF COMMERCE

DEPARTMENT OF BANKING

APPLIED ECONOMICS I

CBA 4103

FINAL EXAMINATION

JANUARY 2008

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATES

This paper contains SIX (6) questions.

Answer any FOUR questions.

All Questions carry [25] Marks each.

Start the answer to each full question on a fresh page.

Indicate on your answer booklet whether you are in the conventional or parallel programme.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

The businesses in this question paper are intended to be fictitious.

This paper consists of 5 printed pages

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[Turn over]

QUESTION 1

The neoclassical thinking assumes that all firms are established with the intention of making profits has been challenged by the managerial discretion models of Baumol and others.

- (a) Discuss two managerial discretion models and show clearly how each one of them differs with the traditional model of the firm. **[20 marks]**
- (b) How realistic is Baumol's sales maximization model from your experience with business objectives as pursued by Zimbabwean firms **[5 marks]**

[TOTAL 25 MARKS]

QUESTION 2

The Government of Zimbabwe can use game theory to explain the political state of affairs with Britain for geopolitical influence since the implementation of the 2000 land reform policy. Assuming that each country has a choice of two strategies: Aggression and Restraint, the payoff for the game is shown below;

		BRITAIN	
		Restraint	Aggression
ZIMBABWE	Restraint	4, 3	1, 4
	Aggression	3, 1	2, 2

For each player 4 is the best and 1 is the worst.

- (a) Does either country have a dominant strategy? **[4 marks]**
- (b) Suppose the countries move simultaneously, find the Nash Equilibrium. **[4 marks]**
- (c) Next consider three alternative ways in which the game could be played with sequential moves where
- Zimbabwe moves first and Britain second **[3 marks]**
 - Britain moves first and Zimbabwe second **[3 marks]**
 - Zimbabwe moves first, Britain second, but Zimbabwe has a further move where they can change their first move. **[6 marks]**

(d) We know that the single-shot prisoner's dilemma game results in a dominant Nash equilibrium strategy that is Pareto inefficient. Suppose we allow the two prisoners to retaliate after their respective prison terms.

Formally, what aspect of the game would this be? Could a Pareto efficient outcome result? **[5 marks]**

[TOTAL 25 MARKS]

QUESTION 3

Defining Q to be the level of output produced and sold, the firm's function is found by an econometrician to be

$$TC = 100 + 2Q + 0.3Q^2 \dots\dots\dots(\text{equation i})$$

(a) Is this cost function consistent with the law of diminishing returns? **[3 marks]**

Furthermore, the econometrician found that the demand for the output of the firm is a function of price (P) given by the following relationship:

$$Q = 24 - 0.5P \dots\dots\dots(\text{equation ii})$$

(b) Defining total revenue as a function of Q

i. Find the marginal revenue function **[3 marks]**

ii. What is the relationship between the slopes of the average and marginal revenue curves? **[4 marks]**

(c) Given the above functions of equations (i) and (ii), and defining total profits to be the difference between total revenue and total cost

i. Express in terms of Q the total profit function of the firm. **[2 marks]**

ii. Determine the output level where profits are maximized. **[4 marks]**

iii. Calculate total profits and selling price at the profit maximizing output level. **[4 marks]**

iv. If fixed costs increase from \$100 to \$110 in the cost relationship, determine the effects of such an increase on the profit maximizing output level and the total profits. **[5 marks]**

[TOTAL 25 MARKS]

QUESTION 4

With illustrative examples, clearly explain the following concepts:

- | | |
|--|------------------|
| (a) Risk and uncertainty | [5 marks] |
| (b) Diminishing marginal returns and decreasing returns to scale | [5 marks] |
| (c) Adverse selection and moral hazards | [5 marks] |
| (d) Isocosts and isoquants | [5 marks] |
| (e) Optimum and extremum | [5 marks] |

[TOTAL 25 MARKS]

QUESTION 5

- (a) Giving any appropriate economic example, explain the essence of Lagrangean Multiplier Method. **[4 marks]**
- (b) Daffstone Inc. has determined through regression analyses that its sales (S) are a function of the amount of advertising (measured in units) in two different media. This is given by the following relationship (X = Newspaper; Y = Magazines):

$$S(X,Y) = 200X + 100Y - 10X^2 - 20Y^2 + 20XY$$

Assuming the following budget restriction on advertising:

$$X + Y = 20 \text{ units:}$$

- Determine (using the lagrangean multiplier techniques) the level of newspaper and magazines advertising that maximizes sales subject to the budget constraint. **[10 marks]**
- Calculate the firm's sales at this constraint optimum level **[3 marks]**
- Estimate the effect of increasing the budget to 25 units **[5 marks]**
- Give the economic interpretation for the value of the lagrangean multiplier λ obtained in (a) **[3 marks]**

[TOTAL 25 MARKS]

QUESTION 6

- (a) Suppose that two Zimbabwean Electronic Companies, Sponono Light Electrical (firm S) and Mphatso Shine Electronics (firm M), jointly hold a patent on a component used in airport radar systems. Demand for the component is given by the following function:

$$P = 1000 - Q_S - Q_M$$

Where Q_S and Q_M are the quantities sold by the respective firms and P is the selling price

The total cost functions for the two companies are:

$$TC_S = 70\,000 + 5Q_S + 0.25Q_M^2$$
$$TC_M = 110\,000 + 5Q_M + 0.15Q_S^2$$

Assume that the firms act independently as in the Cournot's model.

- i. Determine the long-run equilibrium output and selling price for each firm
[10 marks]
 - ii. Determine the total profits for each firm at the equilibrium output found in part (a)
[5 marks]
- (b) Evaluate the statement that "It has been suggested that oligopolists are deterred from changing prices frequently because they are afraid of the reactions of their rivals and they do not respond to minor changes in costs".

[10 marks]

[TOTAL 25 MARKS]

END OF EXAMINATION

