

AFRICAN ECONOMIC RESEARCH CONSORTIUM

Collaborative MA Programme in Economics for Anglophone Africa
(Except Nigeria)

JOINT FACILITY FOR ELECTIVES (JFE)

JULY – OCTOBER 2006

PUBLIC SECTOR ECONOMICS I

First Semester: Final Examination

Duration: 3 Hours

Date: Thursday, August 17, 2006

INSTRUCTIONS:

ANSWER ANY **THREE** QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS

Question 1

- (a) Consider an economy with two goods X and Y, where X is a private good and Y a public good. Suppose there are two individuals A and B, with utility functions $U_A = U(X_A, Y_A)$ and $U_B = U(X_B, Y_B)$, respectively. Given a production function $F(X, Y) = 0$, derive and discuss the efficiency conditions for the supply of the public good *vis a vis* those of the private good. **(10 marks)**.
- (b) A dam is built to impound the waters of a river to control flooding downstream. However, the dam increases the likelihood of flooding upstream. Discuss the conditions for the optimal dam size and suggest a tax-compensation scheme that might be appropriate for the project. **(10 marks)**.

Question 2

- (a) Explain the Pigouvian remedy to the problem of externalities and then discuss its limitations in relation to a negative externality which is produced by a monopoly. **(10 marks)**.

- (b) The private marginal benefit of a commodity X is given by $100-X$, where X is the number of units consumed. The private marginal cost of producing X is constant at \$50. For each unit of X produced, an external cost of \$20 is imposed on members of the society.
- (i). In the absence of government intervention or negotiations by the affected parties, how much X is produced? **(3.33 marks)**.
 - (ii). What is the Pareto efficient level of production of X? **(3.33 marks)**.
 - (iii). Suggest a Pigouvian tax that would lead to the efficient level being produced, and derive the amount of revenue raised by the tax. **(3.33 marks)**.

Question 3

Suppose an industry has large economies of scale such that it is a “natural monopoly”. Explain the relative efficiency merits and demerits of:

- (a) Operating it as a public enterprise and setting $P=MC$, covering the deficit from general taxation (include a brief discussion on the optimal taxation). **(6.66 marks)**.
- (b) Regulating it such that $P=AC$. **(6.66 marks)**.
- (c) Leaving it to operate as a private sector monopoly. **(6.66 marks)**.

Question 4

- (a) A major problem with the simple majority voting rule is the cycling majority phenomenon. Critically discuss this problem. **(10 marks)**
- (b) Discuss its implications for decision-making in the public sector in the context of the Arrow Impossibility Theorem. **(10 marks)**.

Question 5

- (a) Explain the advantages and disadvantages of (i) the net present value; (ii) internal rate of return; and (iii) benefit-cost ratio criteria in project selection. **(10 marks)**.
- (b) Give **three** reasons for discounting future net incomes to their present value in cost-benefit analysis. **(10 marks)**.